KAYAN MENTARANG NATIONAL PARK

IN THE HEART OF BORNEO

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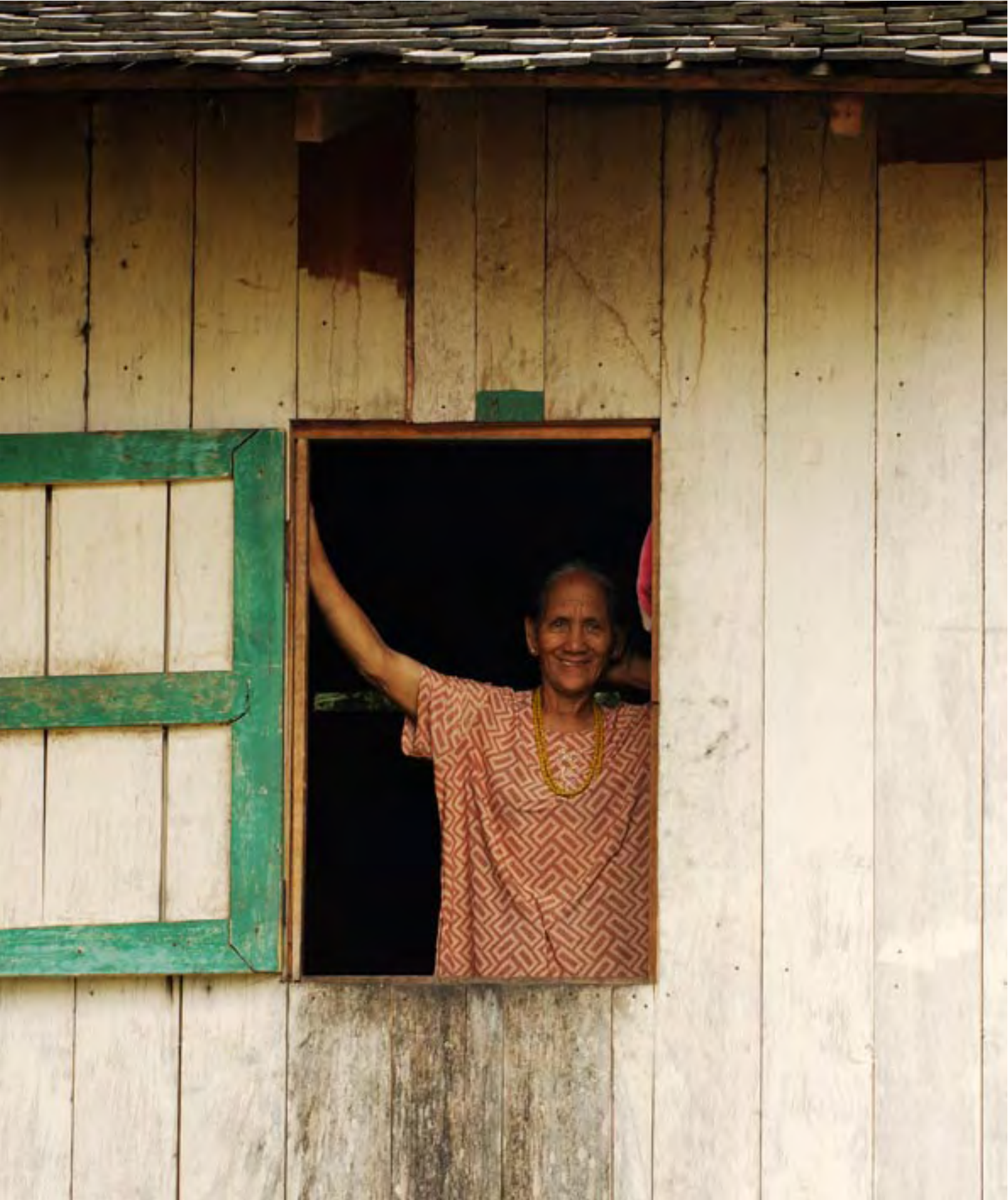


DIFFERENT PERSPECTIVES AND LESSONS LEARNED

COLLABORATIVE MANAGEMENT

Working in times of transition

Indonesia is in a transition period. The country has been through a long-term economic crisis. In addition, some major political and administrative changes have taken place, including decentralization and regional autonomy.

The project has experienced how commitment to conservation and the KMNP can shift very quickly in such a situation - following also the political development in the country. Generally, every newcomer in the political arena, from district to national level, tends to create new policies and new commitments. Consequently, the project has been forced to constantly re-negotiate stakeholder commitment as these were changing or shifting fast.

This was important and necessary work, but consumed a lot of energy and time, which could have been used more effectively to move things forward. The reality faced by the project often prevented or delayed the achievement of the objectives as agreed in the workplan. Activities often took longer than first expected.

The radical change in the government system in Indonesia had an impact on the authority and responsibility in the management of national parks in Indonesia. In several cases, it created differences in perception and confusion between central and local governments on who is responsible for the management of natural resources. The situation was especially sensitive in a project like Kayan Mentarang National Park where a new, collaborative management model was being implemented.

The Ministry of Forestry claims that the authority of park management is the responsibility of the central government, and as such is regulated by basic law on protection of natural resources, Act No 41, 1999, concerning Forestry, and Act No. 5, 1990, concerning the Conservation of Living Natural Resources and its Ecosystem. In reality, on the ground, the Ministry of Forestry has never had any staff assigned to KMNP during the period since the area was designated as a Strict Nature Reserve until the status was changed to National Park.

At the same time, the local governments argue that park management is part of their responsibility, although this is doubtful based on present regulations. Local people who are indigenous and have been living inside and around the park for centuries claim that the park is an integral part of their customary territory. They claim that they are the ones who have managed and preserved the forest for generations, and therefore should continue to maintain management authority over the resources.

Confusion on responsibilities and potential conflict between different interests and views may be reduced by adopting a model of collaborative management. This is the model chosen for the Kayan Mentarang National Park where three parties (central government, local government and the communities represented by FoMMA) will work together and share responsibilities in the management of the national park. This solution would work to avoid conflict.

In addition to the three main stakeholders, there are however other parties that might have specific interests regarding the exploitation of natural resources in the area, especially investors. Suspicion and hostility towards the park can easily arise if the pursuit of somebody's interests is hindered or delayed, and individual wishes are denied. As a result, WWF as a facilitator for both sustainable development and conservation has at times become a 'shooting target' and, in extreme cases, the 'public enemy'. The situation has proven to be a big challenge for the Kayan Mentarang project. (See also under 'Threats towards the park').

Previous page: A woman relaxing in the middle of the day in Long Padi, Krayan Tengah

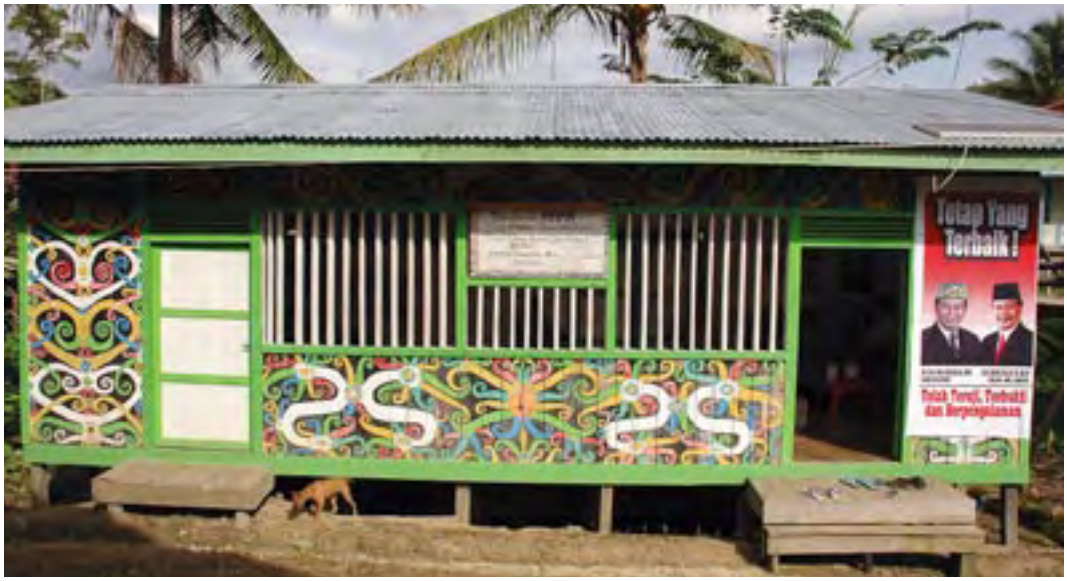
FOMMA - THE ALLIANCE OF THE INDIGENOUS PEOPLE OF THE KAYAN MENTARANG NATIONAL PARK

FoMMA was established in October 2000 and has today around 50 members. Over the years, it has become internationally recognized as an important institution representing indigenous people's rights in KMNP. Evidence for this is that the Head of FoMMA was invited to give a talk at the World Park Congress in Durban, and that the Indigenous Peoples Network in SEAsia identified FoMMA as a possible leading organisation for the network in the future.

FoMMA is an organisation comprising a number of sub-ethnic groups, which have one interest in common, namely creating a stronger voice for communities in the management of the national park and for the respect of communities' rights. FoMMA represents a rare example of how indigenous people and communities could come together and organize to advocate their rights with regard to the conservation area. At the same time, this is also a potential weakness. The organization needs to consolidate and secure its internal unity and common vision.

Over the period of the project, acitivities focused on capacity building of FoMMA members. The project organized training in conflict resolution, legal drafting, management, and facilitated several study trips and visits to relevant sites, including across the border to Sabah. This proved to be very important in order to encourage relations with other indigenous peoples across the border, who share many of the same cultural traits and face common challenges.

At national level, FoMMA is recognized through the three ministerial decrees related to the collaborative management of KMNP. FoMMA is an independent organisation representing the interests of the communities of the park and, as such, is part of the collaborative management. However, it remains to be seen whether FoMMA will be able to enjoy the same rights and responsibilities as the other stakeholders in the management body.



Field post and office of FOMMA in Data Dian decorated with traditional Dayak motifs

Women from Pa'Upan, Krayan Highlands, returning home from their gardens

At district level, the legacy of *adat* and role of customary chiefs are recognized and respected. *Kepala Adat* receives a small salary from the government. *Kepala Adats* are automatically members of FoMMA and tradition keepers within the organization.

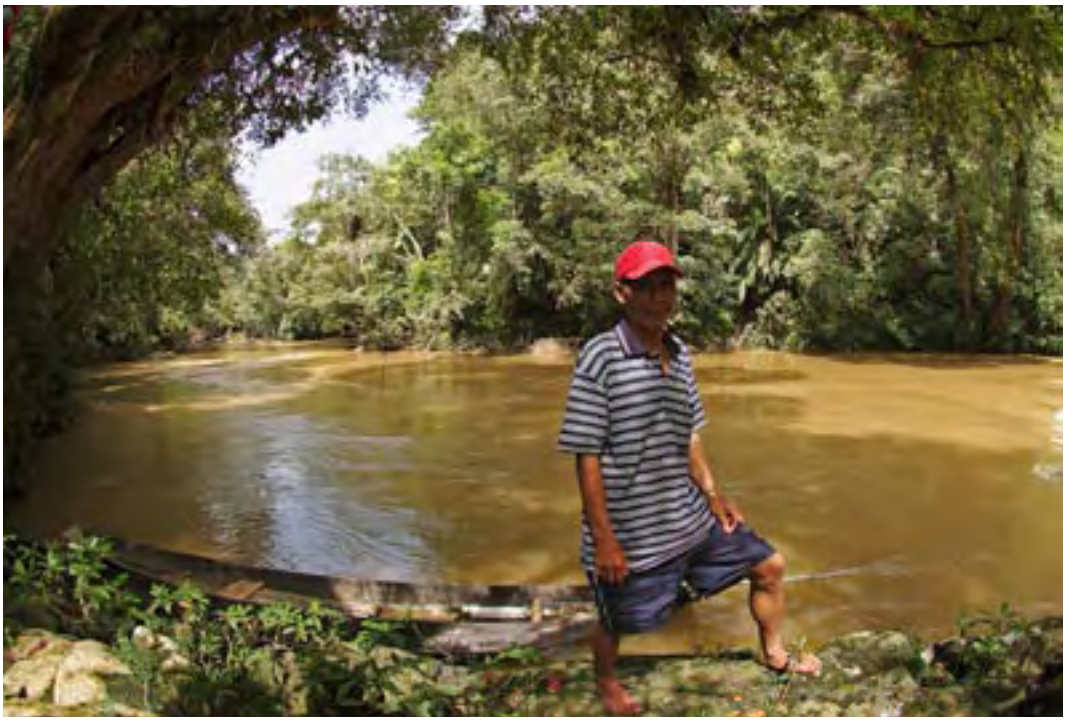
Many members of the district government have come to recognize the value of FoMMA and are very supportive of the organization.

FoMMA's main task now and in the future is to represent the local communties interests on the Policy Board and in the collaborative management of the park. In this respect, more capacity building and organizational development will be needed to enable FoMMA to face future management and policy challenges.

COMMUNITY EMPOWERMENT

The legacy of the Culture & Conservation research program

The Danida-funded project started in December 1996. Seven months later, the third and final phase of the Culture and Conservation project aimed at: 'documenting and supporting traditional rights of tenure and local resource management and contributing to the cultural history and the forest ecology of the region' ended. The short overlap was something more than a coincidence. In many ways, the output of the Culture and Conservation program provided the main justification for the Danida project to assist the establishment of a community-based



Local people living in and around the Kayan Mentarang National Park have managed these forests for generations

management in the Kayan Mentarang National Park. It also positively affected the kind of relationship that bound together local communities, local government, and WWF especially in the first phase of Danida (1996-2000). It offered that legacy of trust that was built in many years of working together with local communities to preserve indigenous knowledge and recognize local management and land tenure practices.

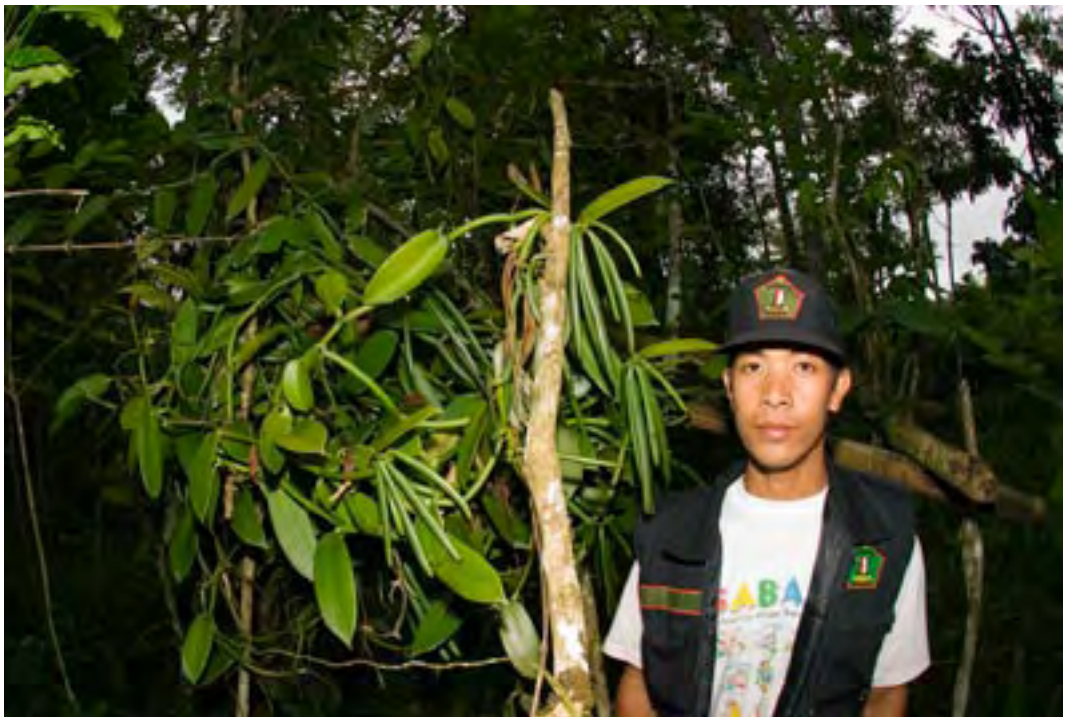
This legacy of trust was not always managed wisely by the project and sometimes squandered by empty promises, long bureaucratic processes, uncertainty, and a long wait for signs of implementation of the collaborative park management. If nothing else, it made us all very aware that any activity, any project implementation does depend on trust and support by local people as much as it depends on the skills and expertise of the staff working on the project.

Local managers of the forest

The history of the project shows a first phase more social benefit-oriented and a second phase more economic benefit-oriented. In any case, programs developed to increase support and participation of local people should consider both dimensions, the social dimension (rights, duties, privileges, regulations about the sustainable management of natural resources) and economic dimension (small business, profit, rewards from the sustainable management of natural resources), and integrate them.

During the first phase, attention was devoted to making sure that the rights and claims of local people be recognized in the management of the conservation area. The customary leaders were engaged first hand in collecting data and evidence of adat management (community mapping), presentating the results to government officials, and advocating the rights of local communities to be managers of the NP.

Community mapping, and the close collaboration between WWF and local customary councils, raised the social and political profile of the councils and increased the visibility of some of their most active leaders. This brought about a renewed confidence in the ability of local institutions to manage the forest on their own. In some cases, communities did not fight the idea of a conservation area and



One of the economic development activities has focused on the start up of vanilla gardens, as here shown by a man in Binuang, Krayan Tengah

the importance of protecting forest resources for future generations, but challenged the need for an external institution like a national park to do that. They claimed they can do it on their own as they have been doing for centuries before. After all, in their view, the forest is still there as strong evidence of good local management.

Community grants: capital, ownership, and accountability

In the second phase of the project, the community empowerment component came to focus more consistently on creating and developing economic benefits from conservation areas for local people.

The approach was by small pilot projects targeting conservation-based activities and enterprises. Local associations, local groups, or councils were the main planners and implementers of a program commonly agreed and supported by the disbursement of a small grant.

The community grants program proved an effective means of financing initial stages of small-scale economic enterprises. Local initiatives centred on the following: community-based ecotourism; sustainable agriculture; traditional medicinal garden, cultural revival; handicraft production; gaharu; vanilla; wild honey. Activities also included workshops/meetings and training sessions to develop local skills. In some cases (ecotourism), cross-visits to Sabah were organized and training for local guides took place in Sarawak. This was done to encourage sharing of experiences and build stronger partnerships across the border for community-based ecotourism.

The program strengthened the capacity of local groups to plan and implement activities in a more systematic way by drafting proposals, planning, and evaluating the output. However, we realized that the administration of community grants requires a longer implementation, more frequent coaching and business development sessions to ensure most effective results.

One of the reasons the program was well received is that the program was the result of a long period of collaboration with the same groups. This seems to indicate one more time that trust can be hardly substituted as key asset upon which to build real collaboration and accountability for conservation among all stakeholders.

A NEED FOR AWARENESS AND EDUCATION

Environmental awareness and education are an important part of the project efforts to build support among stakeholders for the sustainable management of natural resources in the Kayan Mentarang National Park (KMNP). Ideally, building awareness should be started at an early age and maintained throughout as part of a continuous learning process. It might take a long time before the 'students' really understand ecological processes and the importance of conservation and internalize that knowledge to influence their behavior in daily life. For this reason, the project has organized several capacity building sessions for a selected group of schoolteachers in three Districts in East Kalimantan (Malinau, Nunukan and Tarakan).

The objective was to develop a school curriculum focusing on environmental education for children. WWF provided training on how to develop teaching and studying material on environmental education for the so called Curriculum Committees of the District Education Offices. The participants were very interested and enthusiastic about the training.

The material produced was a series of textbooks for students and teachers at all levels (6) of elementary or primary school. The material was successfully tested at selected schools in Malinau, Nunukan and Tarakan. The success of the trials and the environmental education initiative of the three District Governments caught the attention of the Provincial Government. This, in turn, has stimulated District Governments to allocate more funding for environmental education.

Preparing for a puppet show performance during the Regional Development Exhibition in Samarinda

INVESTIGATING AND MANAGING THE BIODIVERSITY WEALTH OF KAYAN MENTARANG

Comprehensive knowledge of the ecology and species richness of the forests of Kayan Mentarang is essential for the wise management of the national park in the future. Several survey activities were conducted to collect and analyse data on all major biodiversity aspects. This information is now available to the stakeholders which will be responsible for the management of the national park. Part of this information has already been translated into clear management recommendations.

Joint biodiversity expedition

A large joint expedition was organized in 2003. The expedition took place in the vicinity of the village of Pa'Raye, in the Krayan Hilir area in the north of KMNP. Many scientists, from Indonesia as well as from Malaysia representing various fields of science, participated in this expedition. The expedition provided detailed information on many animal and plant groups that had not previously been studied in detail such as insects, small mammals and fungi. The expedition also enabled the conservation biology team of WWF to investigate the landscape ecology of Mount Harun in the very north of the National Park.

Next to the many scientific results given by both socio-economic and natural scientists, one of the best side-effects of this expedition was to promote Kayan Mentarang to a wider audience, and strengthen the collaboration and relationship between Malaysian and Indonesian scientists and government officials.

Species management plans

Species management plans were commissioned for selected key species groups that deserve special attention in the Kayan Mentarang National Park. These were: primates, felidae & viverridae (forest cats, civets and mongooses), bearded pigs, orchids, and rattans. Specialists together with the WWF team produced five management plans. Training on basic knowledge and survey techniques was also organized for BKSDA staff, members of the local communities and other stakeholders. The broad participation produced management plans that are suited to the needs and local circumstances of the KMNP.

Insect identification at the research station Lalut Birai, Hulu Bahau

Biodiversity surveys

Several biodiversity surveys were conducted during the second phase. The surveys were carried out in remote areas that had not been covered during the first phase of the project, and provided very

During expeditions, birds like this beautiful Rufous-collared Kingfisher, are caught in nets and registered. Afterwards the birds are released back to the forest

important additional information on the biodiversity of Kayan Mentarang National Park. Some interesting findings included:

- The biodiversity survey to the Paye Rungan plateau showed that this area has a very distinctive vegetation composition and structure, and a high number of rare herbaceous plant species were discovered.
- The mountains that divide the drainage areas of the Krayan and the Bahau rivers are covered by species-rich and extremely humid montane forests. A high number of bird and frog species was also found to occur here.
- The upper reaches of the Bahau River are unlike other parts of KMNP covered by particular forest types where large Dipterocarps are almost absent.
- The biodiversity survey to the upper Mentarang River was the first ever to this area. It provided information on the forest types and major tree species. Several snake species were found here, including five new records for Kayan Mentarang.

These surveys enabled BSKDA staff to get to know the ecology of Kayan Mentarang. No fewer than nine BSKDA staff joined the biodiversity surveys, and received training prior to the surveys.

Long-term ecological research

Long-term phenology records on production of leafs, flowers and fruits were collected for a high number of tree species of the forests of Kayan Mentarang. The analysis provided important information about productivity of the forest trees, and phenology and periodicity of important fruit species is now much better understood. Similarly, we have a better understanding of mortality, growth, regeneration, and the dynamics of rainforest.

Reforestation trials have focused on the cultivation of three local hardwood species and *gaharu*. Local staff and people were trained in inoculation techniques of *gaharu* trees. Small *gaharu* pilot plantations were started in (3) villages of Kayan Mentarang.

Long-term monitoring of mammals provided information on habitat preferences of all the major mammal species of Kayan Mentarang. Most carnivores of Borneo have been observed in the National Park. Diet studies of some of the major ungulates provided insight in the food preferences throughout the year. More than 300 bird species are known from Kayan Mentarang National Park, including many species endemic to Borneo. Several new records from Indonesia were made. The long-term monitoring of birds at the field station provided a clear picture of habitat preferences of hundreds of species.

Herpetofauna inventories yielded a high number of frog, snake, lizard and turtle species. Many of these were new records. A high number of fish species have been described from the rivers and streams of Kayan Mentarang.

Information dissemination about biology & ecology of Kayan Mentarang

A workshop was held in Long Alango in June 2005.

During the workshop, the results of the Lalut Birai research activities were presented to and discussed with the local communities and other stakeholders.

The results of the long-term research program at the Lalut Birai field station were also compiled in a bi-lingual book ('the Ecology of a Tropical Rainforest in Kayan Mentarang National Park in the Heart of Borneo'), to be distributed to various stakeholders.

Visits by local students and international scientists

WWF facilitated several students from local universities to come to Lalut Birai to do ecological studies in the vicinity of the station. The results of their studies were used by the students to fullfill school requirements. At the same time, they provided interesting additional information for the long-term research programme of WWF.

Several foreign scientists worked for periods at Lalut Birai doing field research. The natural conditions of the forest, the high number of habitats and the good facilities of the station were considered as a major reason to come all the way from afar. The major constraints for getting more foreign researchers to the area have been the difficulties related to research permits and the remoteness of the area.

Two members of the Joint Expedition are doing species identification on mice and rats. These are caught in traps, which have been put on strategic places in the forest

GIS INFORMATION IN SUPPORT OF THE KAYAN MENTARANG NATIONAL PARK

Forest coverage in Kayan Mentarang still in good conditions

Based on Land-sat images analysis (ETM 7) 2001-2005, most of forest area in KMNP remains in good condition. However, aerial monitoring surveys carried out annually and ground checking survey in 2005 revealed that there are some encroachments at three locations along the park's western boundary. The boundary also marks the border between Kalimantan and the Malaysian States of Sabah and Sarawak. The last two surveys saw participants from different institutions like Police, Army, Ministry of Forestry and State Ministry of Environment. Results of the surveys have been delivered to all relevant stakeholders for follow-up action.

The expectation after such a survey trip is that there would be an immediate follow up in the form of enforcement to prevent more damages. However, political considerations and motives might delay the process.

Some expansion of forest clearing for local shifting cultivation purposes has also been recorded in areas of the park during the last two years (upper Bahau River and Krayan). The expansion is limited and might be due to growing population. In this regard, it is very important to continue the spatial planning exercise in the customary lands to document present and future needs of the local communities before boundary demarcation.

The conflict about the park boundary

Although the status of Kayan Menatarang was changed into National Park in 1996, the outer park boundary still follows the old boundary of the nature reserve (*Cagar Alam*). This boundary is strongly

opposed by local communities, mostly because some of their cultivated land and village land were included in the conservation area. Local communities have made recommendations for the redrawing of the external boundary of the park to exclude agricultural and other land from the National Park.

More recently, the project has helped the authority responsible for park boundary demarcation (Provincial Forest Land Use and Inventory Office) conduct public consultations in the customary land areas and Sub Districts. The purpose is to further discuss boundary recommendations directly with local communities and government and come to an agreement that would satisfy all parties.

The process will not be easy, yet it is necessary in connection with future sustainability of the conservation area and support by its stakeholders. The official spatial planning process (macro level) at district, provincial, and national level is also under way. The complexity of diverse and changing interests involved is staggering, and it is a challenge to accommodate them.

FoMMA has been coordinating consultation meetings at village level and facilitating meetings at customary land level for the redrawing of the external boundary of the park and future land use. All information gathered from these activities is being analyzed and digitized by the GIS component to produce a land use plan for buffer zone areas and a proposed new park boundary. Once finalized and agreed by all local stakeholders, the maps will be submitted to the Ministry of Forestry for final approval.

The process will take a long time. The boundary will have to be marked on the ground in a participatory manner. However responsibility for this big task will be with the management unit of the park.

THREATS TO KMNP

Since the beginning, the project has identified a series of potential threats to the integrity and sustainability of the park, including suggested plans for infrastructure (roads) and plantation development (oil palm), both involving cutting down large tracts of forest in the Kayan Mentarang National Park.

There have been several cases where local communities have been approached by outside investors making promises of better lives and profits if they supported new development plans. This strategy, particularly if used by local businessmen, has been quite successful and convinced several communities to withdraw their support for the National Park. WWF was perceived as the defender of conservation and promoter of the need of environmental assessment for the proposed road construction plans.

Occasionally agreements have been signed between parties that had no legal right to enter such agreements. This, most likely, is the result of confusion regarding authority and responsibilities among local, district, provincial and central agencies.

Illegal logging

It has been estimated that Indonesia is loosing 3-4 billion USD through illegal logging activities each year. A good share of illegal logging is taking place in protected areas. Compared to many other protected areas in Indonesia, Kayan Mentarang National Park has so far been spared big scale encroachment. It is actually only recently that some illegal activities have become visible at the border area with Malaysia. This may be due to the fact that logging concessions across the border in Malaysia are now moving closer to the KMNP border. The remoteness and isolation have so far proved a very good protection against encroachment.

The project has monitored activities along the

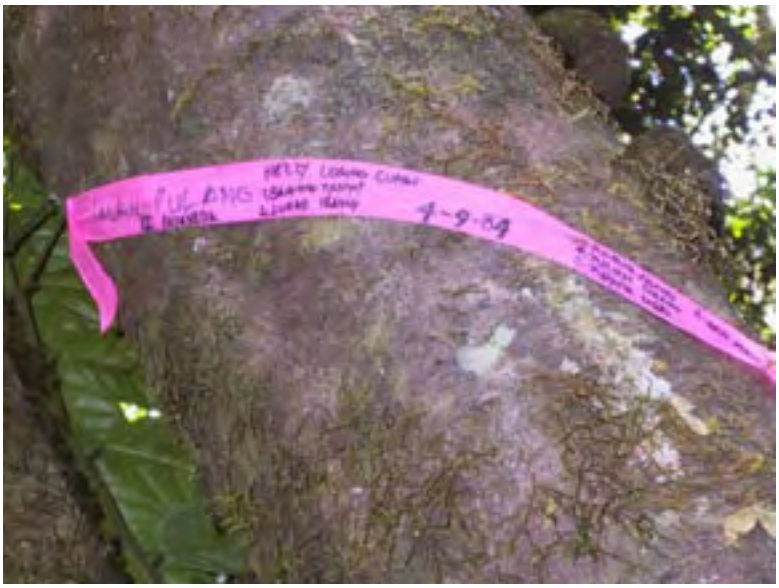
border area via the analysis of satellite images, flyovers, and ground checking. Recent reports in 2005 show the existence of three sites were illegal activities are taking place. One location is in Lumbis, Nunukan District, close to the border with the Malaysian state of Sabah. The other two are further south, in Kayan Hilir and Hulu Bahau, both in Malinau District, close to the border with the Malaysian state of Sarawak. This information has been promptly reported to the relevant agencies, including the Ministry of Forestry through PHKA. The hope is that the Indonesian government will take this threat seriously and take action in the future.

A road across the border

In early 2003, rumours flourished about plans for a road across the border from Krayan to Ulu Padas in Sabah (where WWF also had a Danida supported project at that time). Rumours became more solid evidence when a WWF biology team participating in the joint expedition in Krayan Hilir came back with photos showing freshly painted marks on trees far into the forest north of the base camp in Pa' Raye. Ulu Padas and Krayan are both inhabited by Lundayeh people, but history and state formation have divided families across the border. This aspect is relevant in the sense family ties might have been used as a tool to gain strong support for the road plan across the border. Trade was also an issue. Krayan people have been trading across the border with Sarawak by using a foot and motorcycle trail. However, an unresolved conflict with the nearest village on the Sarawak side has made trade at this border crossing difficult and more expensive. The new road plan offered an alternative trading opportunity.

Initially, it was difficult to get a clear picture of who was actually involved, although many local people talked about 'a businessman from Malaysia'. There were also different reports on how much forest this businessman would be allowed to cut on each side of the planned road as a kind of compensation or cost recovery for road construction. Some talked about 500 meters and others about 3 km. Either way, it would mean the logging of a lot of pristine forest containing valuable agathis and other sought after timber. In the end, it became clear that the concession company operating just across the border in Ulu Padas was involved.

The company and allies at district level underestimated the reaction of conservation NGOs in East Kalimantan which were against the planned encroachment into the national park area and heritage. The NGO alliance was strongly supported by BKSDA of East Kalimantan and the Directorate General of PHKA in Jakarta. The Director General of PHKA sent a letter to the company in Sabah explaining that the authority of national parks is under the central government, and that any kind of encroachment into the KMNP, 'which causes damage to the protected ecosystem can be considered as a criminal act, subject to sentences of jail and fines'. This was an unequivocable message quickly reported by the newspapers in Sabah. It caused few reactions at high level, and eventually, things calmed down.



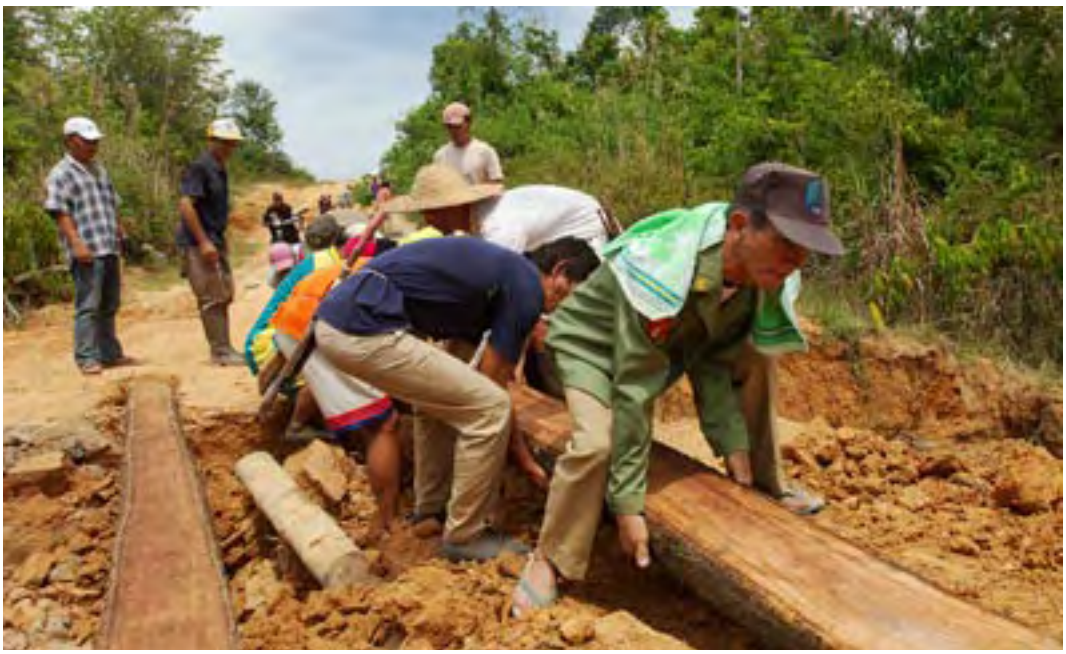
A sign left after illegal logging activities and found during a ground survey in Hulu Bahau, two days walk from the village of Apau Ping, near the border with Sarawak

Plans for the construction of the road are still very much alive, but what happened however forced all stakeholders to realize that plans of this kind ought to be dealt with through legal channels and appropriate mechanisms, and with the competent authorities. This includes the carrying out of environmental impact assessments and, in this particular case, also negotiations with the Sabah State on whether they are interested in a road and an international border crossing in the Ulu Padas area.

The biggest oil palm plantation in the world

It all started in July 2005 when the newspaper 'Jakarta Post' wrote that the Indonesian Minister of Agriculture had put forward a plan for the establishment of the world's biggest oil palm plantation covering 1.8 million hectares in Borneo along the 850 kilometer border between Indonesia and Malaysia. The plan would of course mean the destruction of areas like the KMNP stretched along the border with both Sabah and Sarawak. Plans for roads along the border, as both for a 'security' and development reasons, had in the past been mentioned or appeared in some spatial plans. Was the oil palm plantation an opportunity to revive also road plans along the border? Some evidence in this direction indeed existed. According to media releases, prospective foreign investors had already been invited to invest in the region, including China. Some might then question the 'economic rationality' of planting oil palms on mostly unsuitable soil (elevation, fertility, etc.), unless the main objective was to get control over the timber and land of the area. It also turned out that timber and paper companies were indeed linked to the development of this oil palm scheme.

The WWF Heart of Borneo (HoB) initiative (see about this in the chapter 'The future for Kayan Mentarang National Park') promptly reacted to the plan which would have represented a huge threat not only to Kayan Mentarang, but also to other protected areas both in Indonesia and Malaysia.



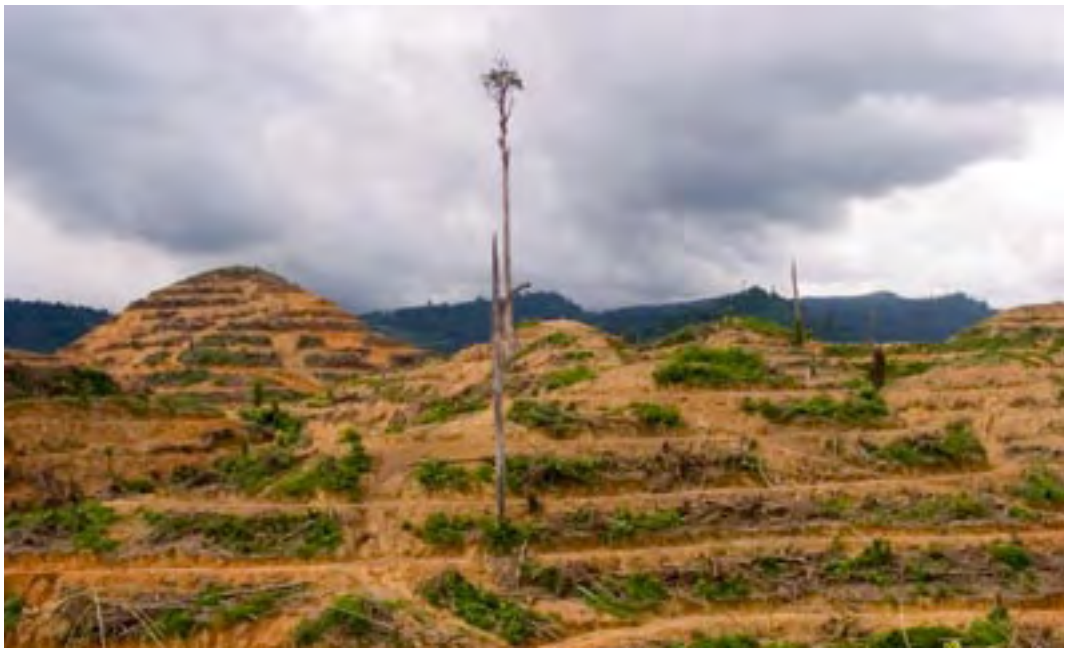
The forest has been cut down. The road has been put through - but who is going to pay for the maintenance of the road?

A strong campaign was started, press releases were sent out, and relevant ministries were contacted. The international WWF network informed donors with an interest in the Heart of Borneo. Danida also expressed its concern to the Indonesian government about how this plan could affect negatively a protected area they had supported for nearly ten years.

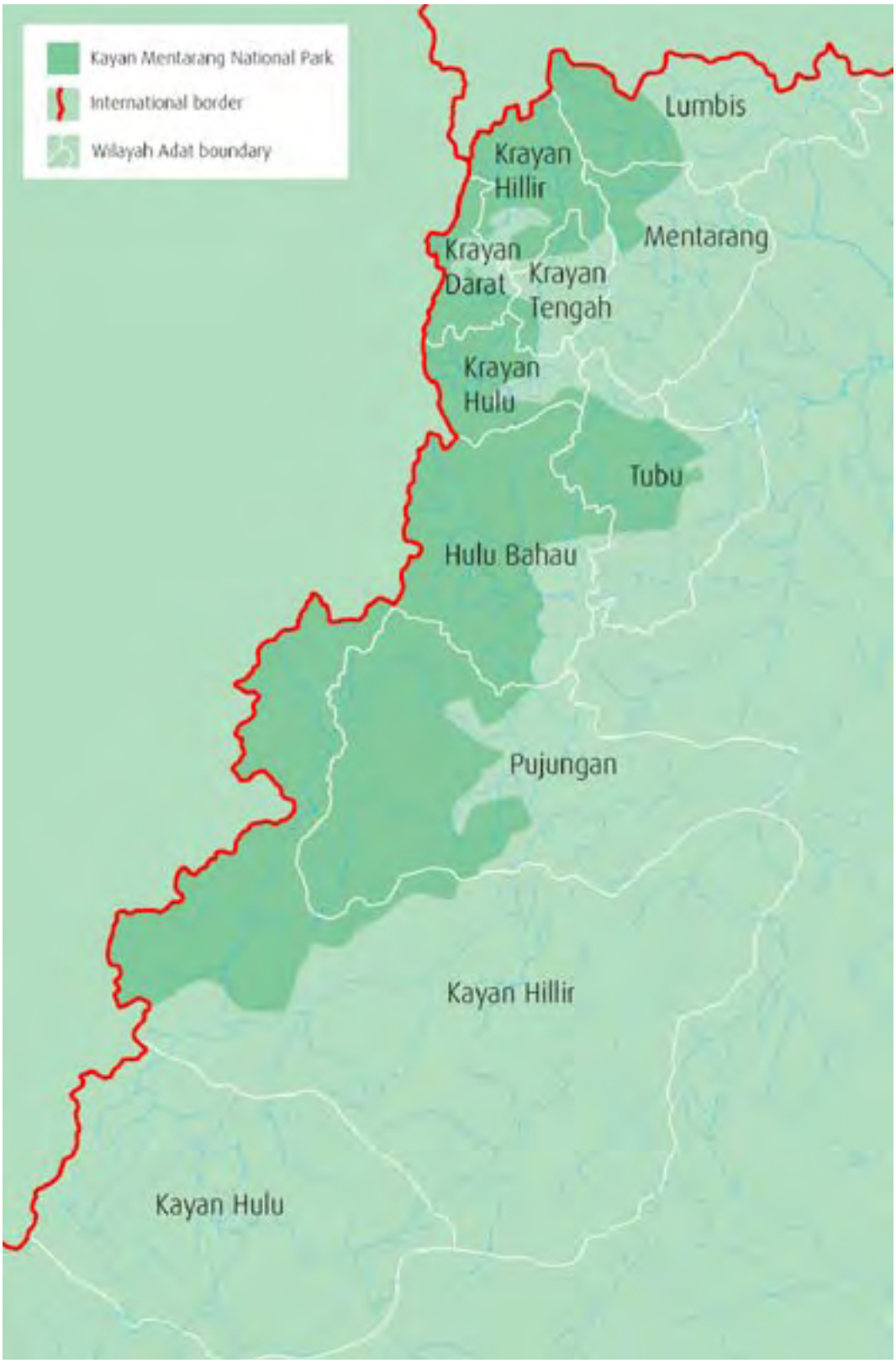
By far the most effective effort was from within the Indonesian Government. The Minister of Forestry officially suggested that the Minister of Agriculture review the plan and conduct further evaluation since there are several protected areas located in the region (KMNP and Betung Kerihun National Park). In addition, the Minister of Forestry stated in a press release in mid-November 2005 that there should be no conversion for palm oil plantation in HoB, and that plantations should be established in degraded forest or neglected forest concessions outside protected areas. These areas alone would cover approximately 2.3 million hectares.

The Council of Regional Representatives (DPD) representing the provinces in Kalimantan was also against the plan. They denounced the project as a 'disaster project' in the Jakarta Post, March 2006. Oil palm plantations would mean clear cutting of some of Kalimantan's most valuable and pristine forest areas. They emphasized that what people need is proper education and improved transportation services, and that it will be of no help to local people to cut down the forest and thereby remove the natural resources they depend on. Other international mechanisms like carbon trading and 'debt-for-nature-swap' have also been suggested as tools to protect the forest in Kalimantan.

Hopefully, a sustainable and equitable solution to benefit both the nature of Kayan Mentarangs and the people living around it can be found and agreed upon for the future. One lesson that can be drawn is that as long as there is forest left in Kayan Mentarang, organisations and authorities will have to stay alert to prevent threats of this kind.



A decision to convert forest to oilpalm plantaion is a 'point of no return' decision. The complex environment found in a natural forest can never be recreated


Kayan Mentarang National Park
International border
Wilayah Adat boundary
Lumbis
Krayan Hillir
Mentarang
Krayan Darat
Krayan Tengah
Krayan Hulu
Tubu
Hulu Bahau
Pujungan
Kayan Hillir
Kayan Hulu

THE WILAYAH ADATS OF KAYAN MENTARANG

The Kayan Mentarang National Park area is divided between the districts (*kabupaten*) of Malinau and Nunukan, East Kalimantan. Districts are headed by the Regent or *Bupati*. Districts are comprised of several sub-districts (*kecamatan*), which are administered by a Sub-District Officer, the *Camat*. There are a number of villages (*desa*) headed by a village chief (*kepala desa)*, in each sub-district.

In many areas of Kayan Mentarang, small settlements were re-grouped under a government program in the 1970s. The result is the existence of larger settlements called *lokasi*. Each *lokasi* is constituted by a number of villages.

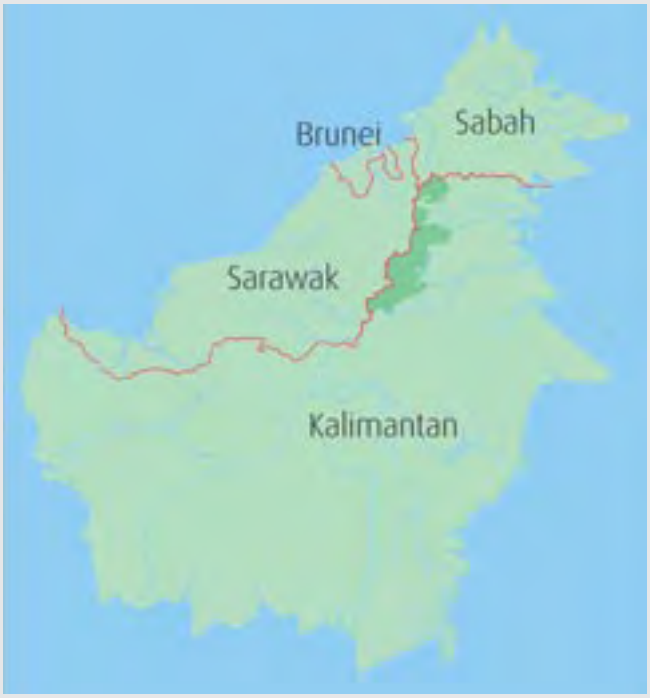
The area of the park is divided into traditional territories or customary lands known as *wilayah adat*. The *Wilayah Adat* (WA) is headed by a *Kepala Adat Besar* whose main traditional responsibility is to oversee social affairs and, presently, help the *Camat* govern the *Wilayah Adat*. The *Kepala Adat* acts as a guarantor of the customary law and regulations that often pre-date the sub-district administration. He is also an arbitrator in matters pertaining to customary rights conflicts and disputes between individuals under his traditional jurisdiction. A recent disposition from the *Bupati* requires that each village elect a *kepala adat desa* or a person entrusted with customary affairs at village level.

This book is divided in chapters each dedicated to a *Wilayah Adat* of the Kayan Mentarang National Park. More than just a convenient way of dividing the huge area of the park into smaller units, the *wilayah adat* represent traditional and cultural divisions, and retain a fundamental importance in relation to the history, ethnicity, culture, social and biological landscape of the area.

The chapters also contain several boxes, some cultural and others biological in content. The cultural boxes provide information related to specific anthropological or historical aspects of a WA, while the biological boxes convey information about typical and important species that are found in KMNP.

There are eleven WAs in Kayan Mentarang in 2005. The chapters however are only nine, as two of the chapters combine the discussion of two WAs in the same chapter: Kayan Hilir and Kayan Hulu (Apau Kayan), and Krayan Darat and Krayan Hilir.

We start our journey through the *Wilayah Adats* of Kayan Mentarang National Park from the south, in the Apau Kayan area.



Kayan Mentarang National Park

Area Size: 1.35 milllion hectares

Status: Established as a Nature Reserve in 1980. Gazetted as Kayan Mentarang National Park in 1996.

Elevation: From 300 to 2000 meters above sea level.

Landscape: Consist mainly of sandstone formations, and app. 21% is volcanic.

Vegetation: Lowland, sub-montane, montane, limestone, heath forest and grassland.

Climate: Generally wet without a pronounced dry season.

Importance: Headwaters of major East Kalimantan rivers, biodiversity hotspot .

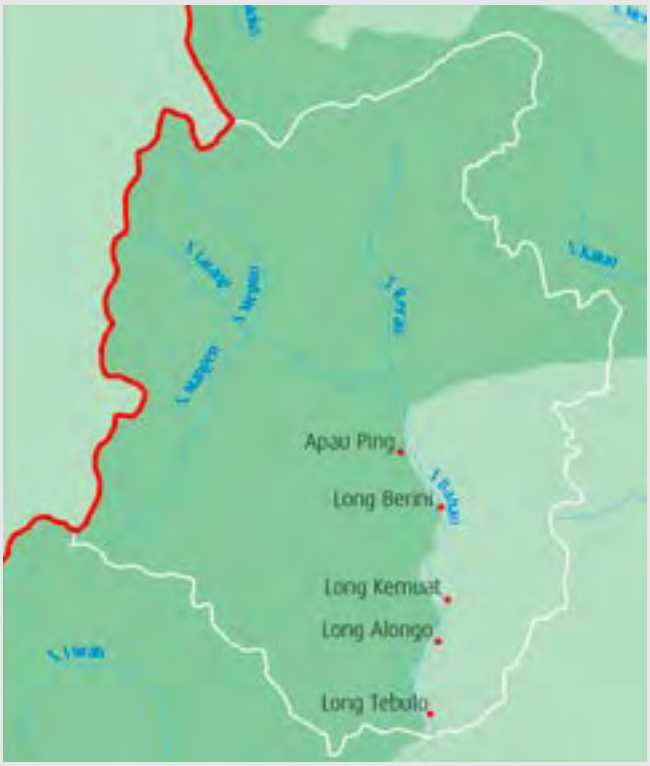
AN OVERVIEW OF WILAYAH ADAT HULU BAHAU

A large part of the customary land of Hulu Bahau is included in the Kayan Mentarang National Park. The territory covers the upper course of the Bahau River, from the border with Sarawak to the west to the customary land of Pujungan to the south and east.

There are only five villages inhabited by two main Kenyah sub-groups. Apau Ping, located furthest upriver on the Bahau River and the last village before the border with Sarawak, has 370 inhabitants. For the most part they are Kenyah Leppo Ke and a few remaining Sa'ban people. Long Berini is a mainly Kenyah Leppo Maut village of 237, with a few Nyibun families. Long Kemuat is a Kenyah Leppo Maut village of 181. Long Alango, the largest village in the area with 541, is a mainly Kenyah Leppo Maut settlement. Long Tebulo, a small Kenyah Leppo Ke village to the south, has 127 inhabitants.

The Hulu Bahau customary land is part of the Pujungan Sub-district, Kabupaten Malinau. However, the distinct ethnicity and history, and the relative geographic separation from the rest of the sub-district are some of the reasons why the Hulu Bahau area might be established as a separate sub-district in 2006.

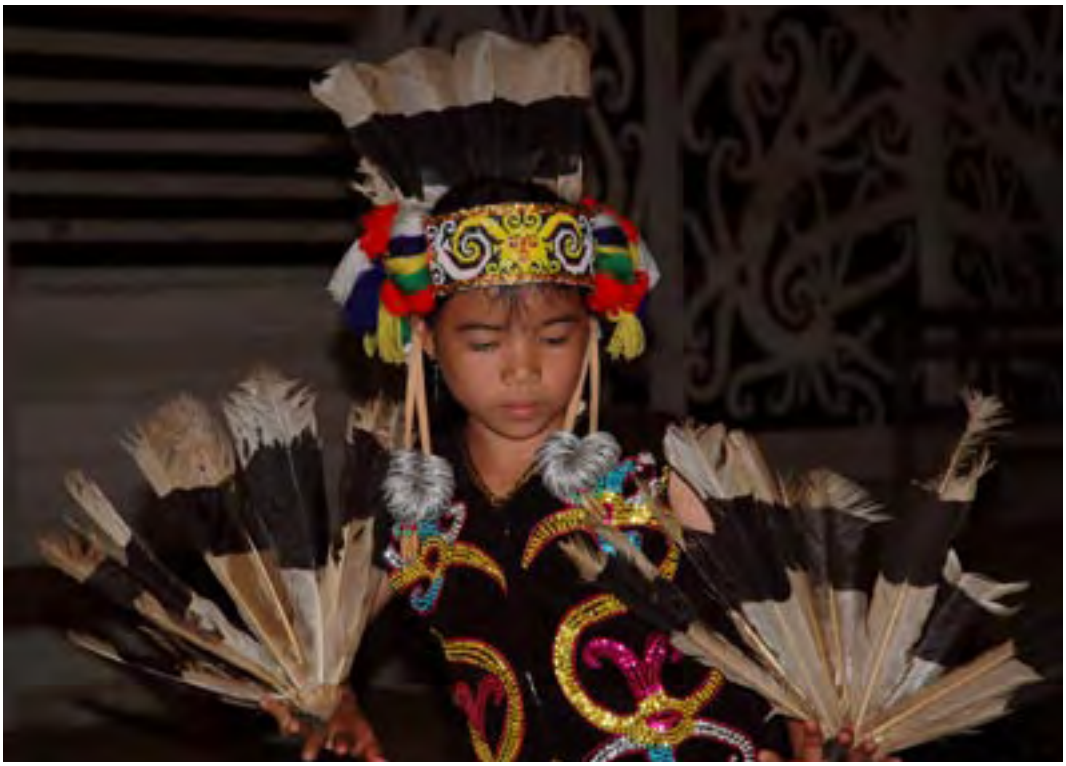
There are two ways to get to Hulu Bahau. One is by longboat following the river route from Tanjung Selor to Long Pujungan, and then continuing on by canoe propelled by long-tailed engine (*ketinting*)



Costumary land area : Hulu Bahau
Area size: 305.000 hectare
Administration : Pujungan Sub-district, Malinau District
Population : 1456
Major ethnic group : Dayak Kenyah
Major landscapes: Sedimentary mountain ridges and hills, volcanic mountains
Major forest types: Riparian forest, hill Dipterocarp forests, mixed hill forests, lower montane Oak-Myrtle forests, upper montane Oak-Myrtle forests, secondary mixed hill forests, secondary hill Dipterocarp forests
Access : Regular/chartered boat from Tanjung Selor/Pujungan
Chartered MAF flight from Tarakan/Malinau

Previous page: The head of the costumary land of the Upper Bahau, Anyie Apuy, and his son, are inspecting an old burial site. These were built by the Ngorek people, who lived in the Hulu Bahau area 300-350 years ago

A young girl in Long Berini is performing the hornbill dance. Hornbills are today protected, and painted feathers from domesticated birds like ducks provide good substitutes



through several rapids. Another way is by twice-weekly subsidized flights (intended for local people) operated by MAF from Malinau to Long Alango.

Similarly to the Apau Kayan, much of the history and economy of this area is linked to the land across the border, Sarawak. The experience of *peselai* (voyaging in search of experience or employment) has been very much part of the social and economic life of most adult men (and several women) in the area. Up to this day, although numbers have significantly decreased, young men still leave the villages in the Hulu Bahau and go to find work with timber companies, oil palm plantations, or to collect forest products in Malaysia. An old forest trail - called *batu kalung* from the name of the mountain pass that marks the watershed between Malaysian and Indonesian Borneo - takes travelers from Apau Ping to Long Bangga, a village on the Upper Baram River inhabited by many Kenyah Leppo Ke people, in five days.

An historical sketch of the Kenyah in Hulu Bahau

Like all Dayak people in the interior of Borneo, the history of the Kenyah people in the Hulu Bahau area is also a history of migrations. Migrations in the past were caused by several factors including fear of enemy attacks at a time when warfare among Dayak groups was still endemic; political infighting or competition between leaders in a community; religion; bad omens or the search for better agricultural soil.

Oral histories maintain that, in the beginning, Dayak Kenyah people lived together in Apau Da'a,

a plateau between the Iwan and Lurah rivers. Due to population growth and lack of agricultural land, Kenyah groups eventually started to split up and move in different directions. The Kenyah Leppo Ke' moved from the upper Lurah (Long Bena, Long Apan) across the mountains to the Beraa River. From there they moved to the Ngiam River (Long Pengayan, Long Lat) and the upper Bahau (Ka Buang, Apau Ping).

The settlements of the Nyibun were located not too far from those of the Leppo Ke' and sometimes, for fear of enemy attacks, they joined settlements. The Leppo Maut people established settlements along the Lurah River and moved to the Hulu Bahau area via the upper Nggeng and the Beraa rivers. In 1957-58, the majority of the people moved from Long Kemuat to the current site, Long Alango.

In the past, villages were often built on hilltops to provide safety and effective strongholds. People tended to stay away from river banks. Nowadays, on the contrary, all Kenyah settlements are located along a river.

The Hulu Bahau area was known during the Dutch colonial period as *Tana Lepo Maut* or "the land of the Lepo Maut". The Dutch first reached Hulu Bahau on a survey mission at the beginning of the 20th century. The area and its inhabitants were later recorded by Jongjans upon his expedition to the area coming from the Apau Kayan in 1917. The author reported that the area did not seem to be under the control of a single leader like Lian Turan of the Uma Alim in Pujungan. The Nyibun, nowadays reduced to a small number and mostly intermarried with other groups, seemed the strongest group.

In Hulu Bahau, contacts and trade with the British territory of Sarawak to the west were more common than with the lowlands on the eastern coast. The Sa'ban people on the Berau River, a tributary of the Bahau River, were surprised when they met the Dutch officers as they had thought their land belonged to Sarawak. Sa'ban people raised

The human like figure, seen on this baby carrier, is often used as a motif by Kenyah people

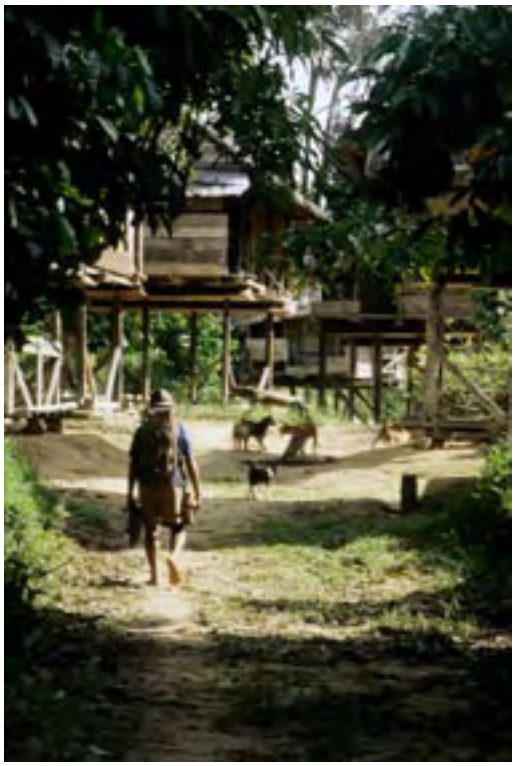
buffaloes, cows and goats that they had brought from the Baram River and Krayan Hulu. The Sa'ban also claimed that they were autochthonous.

The Ngorek, however, were the group who had built the impressive stone burials, the biggest funerary monument in the area, which are thought to be 300-350 years old. The Ngorek people have since left the area and their descendants live in a couple of villages on the lower Kayan River.

More recent migratory movements have also affected the demography of the area. In the late 1960s and 1970s, several families left the Hulu Bahau area to settle on the Malinau River, in the Tanjung Selor area, and other villages on the lower Kayan River. They hoped to get better access to education and health care, and be closer to the market and the economic opportunities of the coast.

Left: Storehouses on stilts like these are often placed on the outskirts of the villages in Hulu Bahau

Right: Rice cooked in the big pot and thereafter wrapped in banana leafs is served in the house or brougt to the fields as a kind of lunch package with plate included

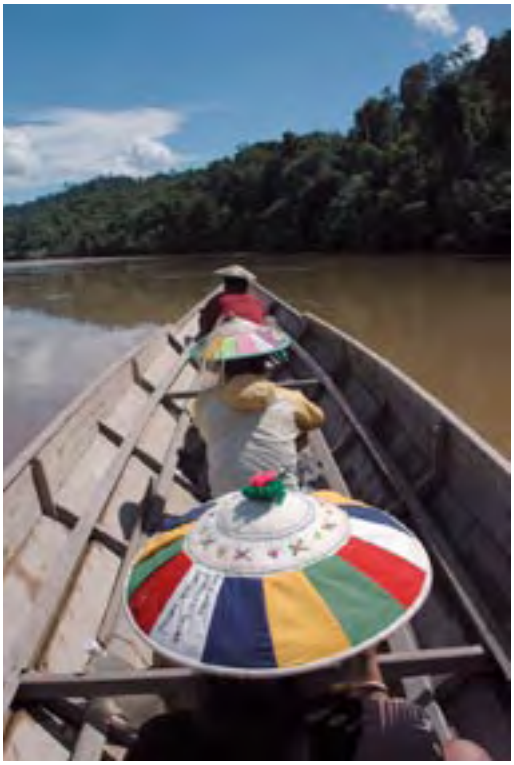


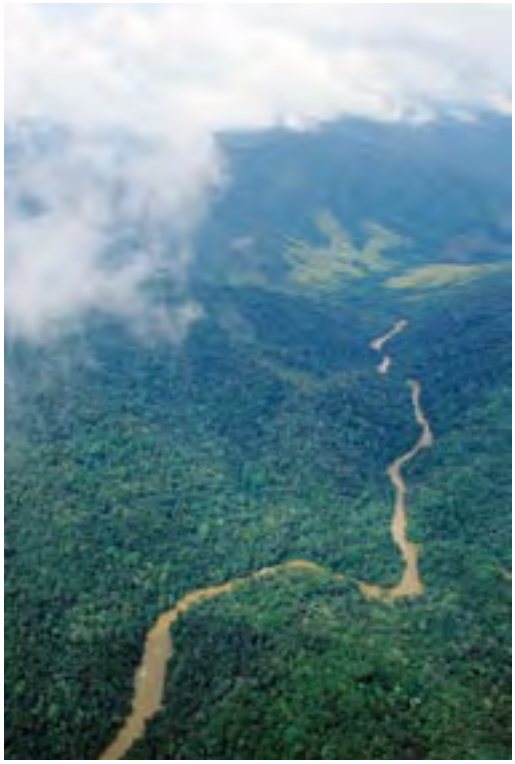
Natural resource management

The Kenyah people in Hulu Bahau developed and applied a row of practices of land management that contributed to sustainable management of resources. Traditional practices were enriched with innovations and experiments that often had important impacts on the livelihoods of local people.

For example, when Apuy Njau, the customary chief of Hulu Bahau, visited Java, he observed how people cultivated irrigated rice fields that produced higher yields. After he returned to Hulu Bahau, he started a pilot project for wet rice cultivation and eventually succeeded. Nowadays, people in Long Alango are all familiar with wet rice cultivation, and half of the rice produced is from irrigated fields. In this respect, Long Alango is unique among Kenyah villages where the preferred rice cultivation method (and often the only one possible due to topographical conditions) is dry or hill rice.

Hunting and fishing are still relied upon as the main sources of protein. Wild pigs remain the favorite meat, followed by Sambar Deer, Barking Deer and Mouse Deer. These activities also represent a major source of enjoyment and pride, especially among men. Hunting is the reason for long treks in the forest, for raising and keeping dogs, and for passionate storytelling about prey and predators, and unyielding pursuits. The activity of hunting, however, is traditionally regulated. There are no quotas, but hunters catch only what they can carry back home. Once back in the village, the meat is divided equitably among the members of the hunting group, plus some is given as a gift to relatives and neighbours.





Left: These colourful, traditional hats, *sa'ung*, are made of sewn sang leaves (*licuala sp.*) and decorated with cloth. They provide good protection both against sun and rain

Right: When flying over the nothern part of the Hulu Bahau area one can get a good view over the grasslands

Traditional tools such as blowpipes are now seldom used, being replaced by guns. However, hunting with dogs and a spear, and catching animals by traps are still largely practiced. There are also strict regulations about fishing, whereby all methods employing chemical products and electricity are banned. The exploitation of valuable forest resources such as rattan, resin and *gaharu* are also regulated. Income from forest products, especially *gaharu*, represents an important component of the local economy.

Land tenure

Similarly to all Dayak people, tenure claims among the people of Hulu Bahau are acquired with clearing a tract of forest for the first time to make a rice field. That forest is *ulen* or owned by that person and his or her descendants as long as they live in the area. Once they have moved out of the village, ownership may be transferred to family members or traded in exchange for goods. These goods could then be used to claim back their right to the field if they were to move back. Otherwise, in absence of any claimants, ownership rights are returned to the community.

The opening of new fields is a collective affair and is discussed during the harvest festival (*damai ajau*). During the event, community and customary leaders provide advice on which areas may be opened for fields in the coming season and ensure equitable land distribution. Rice fields are always worked in clusters as this makes it easier to cooperate and greatly reduces the risks of pests. The plots are delimited by natural markers like a stream, a big

The 'airport' in Long Alango nicely decorated with traditonal Dayak motifs

tree, a big rock, or a wood pole planted in the ground. Boundaries are not erased when burning the fields.

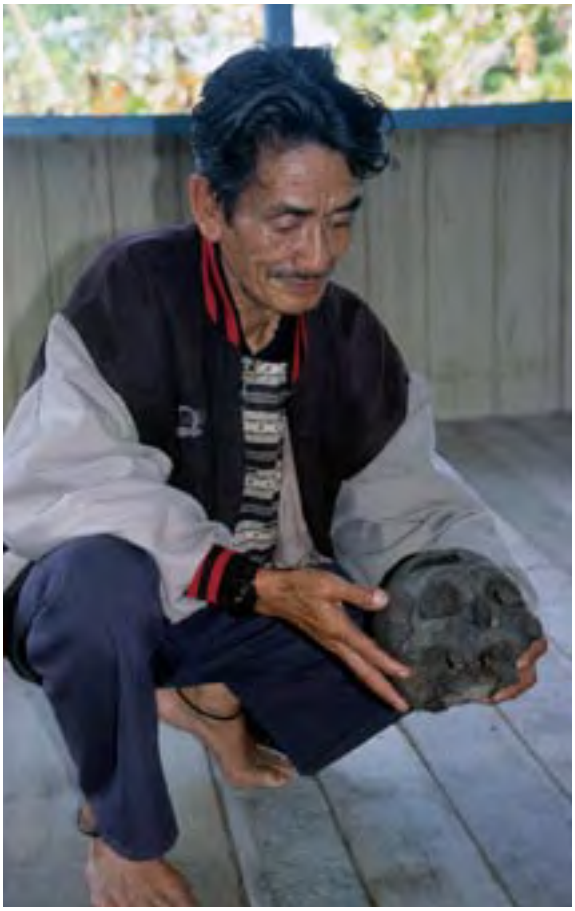
Not only cultivated land is *ulen* or "owned", for forest may also be *ulen* or have restricted access. This is the case with *Tana' Ulen*, a kind of forest reserve managed sustainably in the interest of the collectivity. This traditional form of forest management still exists and is actively maintained among Kenyah people, especially in the Hulu Bahau and Pujungan areas.

In the past, *Tana Ulen* land management was linked to the social structure of Kenyah people divided into three main classes: nobles (*paren*), commoners and slaves. The chief belonging to the nobility usually "owned" a forest reserve and managed it in the interest of the entire community. These days, new values brought by modernity, formal education and Christianity have erased the privileges of the nobility (*paren*), if not their influence, and the management of forest reserves has passed into the hands of the customary councils.

Flight transport to Hulu Bahau is operated by MAF. The small one engine planes can land on the shortest airstrip in the Kayan Mentarang area - only 400 meter before ending in the river

TANA´ ULEN IN LONG ALANGO: A PERSONAL STORY

The *Tana´ Ulen* in the village of Long Alango was established on the Nggeng River by Apui Njau, the customary chief of Hulu Bahau, in 1935. At that time, people who wanted to enter *Tana´ Ulen* to take forest products needed to obtain permission from the customary chief. Forest products, fish or animals were meant not just for personal consumption but for collective interest. Apui Njau established *Tana´ Ulen* in the interest of the entire village. At a time of planting, harvest celebration, a wedding or similar events and large quantities of food were needed, the customary chief used to grant people permission to fish and hunt in the T*ana´ Ulen* area.



Tana´ Ulen was managed strictly as a "forbidden" area or area with limited access. Anye Apui, son of Apui Njau, recalled that if someone dared to put his boat at the mouth of the Nggeng River, that person would be searched and asked what was his purpose entering *Tana´ Ulen* without permission. If it turned out that he had taken forest products for personal use, he would be requested to pay a fine based on customary regulations. In particular, if it turned out that the person had caught fish by poisoning the Nggeng River without prior consent, he would be punished with a more severe sanction.

Since Anye Apui became the customary chief of Hulu Bahau, the management of *Tana´ Ulen* has changed. It is now managed by the customary council in the interest of the entire community. According to Anye Apui, *Tana´ Ulen* is like a village bank or a village rice barn where all resources and products are managed and protected by customary law, and are available in case of need. *Tana´Ulen* on the Nggeng River is rich in forest products such as timber for construction, aloes wood or *gaharu,* resin, game and fish.

In 1992, when exploitation of forest products with high economic value like *gaharu* was at its peak, the customary council of Long Alango decided that outsiders would not be allowed to collect forest products in Long Alango and in the *Tana´ Ulen* area. Long Alango villagers are free to enter the forest, but they are not allowed to use fish poison in the *Tana´ Ulen* area. *Tana´ Ulen* as an institution will be preserved. However, if people's needs increase, and more land is needed for cultivation in the future, the customary council and the customary chief might consider making some changes in the management of the *Tana´ Ulen* area.

Anye Apui, his family has for generations been the managers of the *Tana´ Ulen* in the village of Long Alango, Hulu Bahau

The frog collection of the research station Lalut Birai.
Kayan Mentarang has a wide variety of frog species

AN ECOLOGICAL OVERVIEW OF HULU BAHAU

The drainage area of the upper Bahau River is a very wide area bordering the Malaysian state of Sarawak in the west. The northern boundary is formed by the wide mountainous region that divides this area from the Krayan, while in the east, the Tubu lowlands can be reached by crossing a landscape of mountain ridges and hills.

The Bahau River, which flows from the mountains that form the boundary with Sarawak, is in itself a highly diverse river with many different aquatic habitats. The riverbanks are formed in most places by rather steep slopes, though flat river terraces can also be found. Wide stone banks and impressive rock formations are a common feature in many places along the Bahau. Large rocks and boulders in the riverbed create stretches of rapids in several places. In other places, the river flows quietly through a deep riverbed for several kilometres. The stone banks are of special interest since wildlife can often be observed foraging on them during low water levels. Birds, monitor lizards, frogs and occasionally otters are observed quite easily.

The upper Bahau area was formed by several geological processes similar to those that formed the Pujungan area but less complex. The entire area consists of sedimentary formations, in the form of elongated sandstone mountain ridges and lower hill areas. Within this area emerges a large volcanic mountain complex of high mountain ridges that derive from a central summit area. The major base material of these ridges is basalt. The highest central area of this volcanic mountain complex is about 30 kilometres west of the village of Long Alango.

The Enggeng Bio River drainage and the Lalut Birai Field Station

Coming from the south by boat on the Bahau River, past the village of Long Tebulo, there is a very wide stone bank on the left side of the river. Behind it is the estuary of the Enggeng Bio River. A suspension bridge over the river opens the trail to the Lalut Birai field station, located further upstream, less than one hour walk away. The field station was built on the *Tana' ulen* of Long Alango by WWF in 1991 in order to have a base in the centre of the KMNP where research could be carried out.

The drainage area of the Enggeng Bio River is extremely diverse. Most of the major habitats of the Kayan Mentarang National Park occur in its vicinity. The Enggeng Bio River flows from the high volcanic mountain complex to the west, where elevations reach more than 1,800 metres in height. Several tributaries connect to the Enggeng Bio River that merges with the Bahau RIver at an altitude of about 300 metres above sea level.

Beautiful forests cover the mountains, ranging from extensive upper montane moss forests at the highest elevations and summits to well-developed lower montane Oak-Myrtle forests along the slopes. The mountain ridges of the western massive reach all the way to the Bahau and form the northern and southern boundaries of the drainage area of the Enggeng Bio River.

The valley and lower slopes are covered by species-rich lowland and hill Dipterocarp forests dominated by *Shorea parvifolia, Shorea bracteolata* and *Hopea beccariana*. A high number of *Lithocarpus* and *Euphorbiaceae* species occur under the canopies of the large Dipterocarps. Many rattan and other palm species can be found in the understoreys and the ground is covered by a rich herb layer of gingers, aroids, ferns and begonias.

The Lalut Birai field station has carried out inventories in this area for many years, providing a good picture of the species richness of the area. Census techniques as well as camera traps have confirmed the presence of a high number of mammal species. The number of treeshrew and squirrel species that live in the forests of Kayan Mentarang is quite amazing, with most of the lowland as well as the montane species of Borneo known to occur here. These range from the tiny Plain

In 1991, the local community in Long Alango gave permission to WWF to build the Lalut Birai research station on their *Tana' Ulen*

Pygmy Squirrel (*Exilisciurus exilis*) to the impressive Giant Squirrel (*Ratufa affinis*). Carnivores are rather hard to observe, but over the years, all species of forests cats and nearly all civet species have been recorded here.

Hundreds of bird species were identified from this area that has suitable habitats for all kinds of birds. Several migratory bird species, that come to Borneo from mainland Asia to spend the winter, have been reported from the vicinity of the field station.

The long-term operation of the field station has produced a rather impressive inventory of snake species. Snakes are not so often encountered, but over the years more than 40 species have been discovered. Spectacular species such as the King Cobra (*Ophiophagus hannah*) and the Reticulate Python (*Python reticulatus*) are well known here, but the high number of small snakes that live in the leaf litter of the forest floor also deserves our attention. Many of these small species have subtle patterns of beautiful colours on their bodies.

Daily observations at the field station and the biological work of national and international researchers have helped identify many frog species that live around the rivers and also on the forest floor. Some species spend most of their lives in trees and shrubs, coming down to pools or riversides only to reproduce. The enormous variation of aquatic habitats ranging from small mountain streams to the deep waters of the Bahau River makes it possible for a high number of fish species to be present in KM.

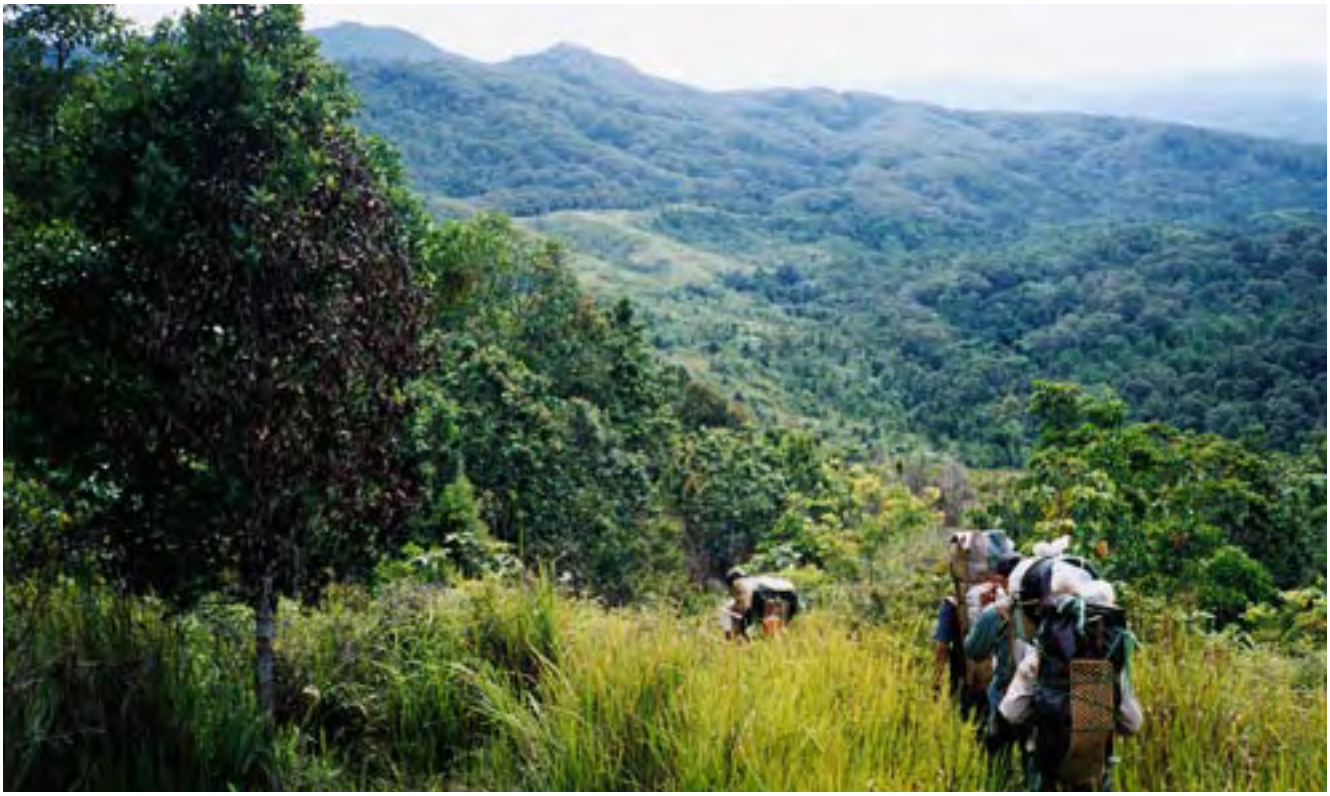
The Pulong River

Further north from the village of Long Alango, one needs to go through a long stretch of rapids on the Bahau River. After the village of Long Kemuat, the Pulong River flows into the Bahau, opposite a famous Ngorek stone burial site. The Pulong River drainage area from the western mountain massive has fertile soils covered with rich hill Dipterocarp forest. Wildlife is abundant in this area, and Macaques and Grey Leaf monkeys are very common.

The Ngiam drainage area

The Ngiam River is the largest tributary of the Bahau RIver on the right side. The estuary is located north of the village of Long Berini, not far from Apau Ping. The large drainage area of the Ngiam River was historically settled by people who have by now all moved out. Old village sites can still be recognised by the many fruit trees that were planted by people in the past.

Most of this area is covered by old and medium aged secondary forests as a result of shifting cultivation by the former inhabitants. These forests have continued to develop and as they are getting higher and richer in tree species, animals are becoming more abundant. Even gibbons, rarely seen



The amazing grasslands are man-made habitats and hunting grounds

in young secondary forests, have been found to return to this area. The uppermost part of the Ngiam drainage area consists of high mountain ridges, covered by primary forests with many large trees. The Tubu area is on the other side of these ridges.

The grasslands

The Bahau turns to the west some 10 kilometres north of Apau Ping. Along this stretch of the river are the famous grasslands, consisting of three separate areas, all on the right hand side of the Bahau River, along the Tua, Kayun and Mepun rivers. These grasslands are man-made habitats and hunting grounds. In the past, people used to burn these forest areas in order to create habitats where large animals, in particular Banteng, could concentrate. The regrowth of trees is halted by the frequent burning, which has been carried out since historical times. The burning favours the development of grasses, in particular *Imperata cylindrica*. *Melastoma malabathricum* shrubs with its attractive purple flowers are common, and in certain valleys, out of the reach of fires, stands of *Tristania* trees occur. The grasslands are favourite habitats of many ungulates, in particular Bantengs (*Bos javanicus*) and Sambar Deer (*Cervus unicolor*) which like to graze on the young leaves that sprout a few days after burning.

The last stretch of the Bahau flows through mountainous terrain. This area has rather poor soils and Dipterocarps are rarely seen, even at lower elevations. Most of this area is covered with Oak-Myrtle forests. The largest trees here are usually *Lithocarpus* and *Litsea* species. On hill tops one can often find stands of giant *Tristania* trees.

BEARDED PIGS (*SUS BARBATUS*)

The wild forest pigs of Borneo are the Bearded Pigs, named so because of the bristles (beards) that grow on the snouts of both male and female pigs. These pigs are found almost everywhere in Kayan Mentarang National Park, from the lowlands up to the high mountains. Our highest record of a Bearded Pig in Kayan Mentarang was at an elevation of 1980 meters above sea level, just below the summit of Mt. Menjoh, where we observed a mother with three piglets passing by.

Diet studies done at Lalut Birai reveal several interesting facts. The diet of pigs consists largely of forest nuts (tropical Oaks, Dipterocarps, etc.) but apart from this, a wide variety of food is eaten. Most pigs swallow small amounts of beetles, and they also scavenge on carcasses of many different animals. It was also found that Bearded Pigs often feed on *Arenga obtusifolia* palm fruits during periods when few other fruits are available.

A remarkable aspect of pig distribution is the seasonal fluctuation. During periods when many fruits are available, pigs can be very abundant in a certain area, while during "dry" periods few pigs are present. Mass migrations of pigs occur during mast fruiting periods in the forest, when large numbers of pigs can be seen crossing the larger rivers of Kayan Mentarang. During the mast fruiting year of 1997-98, a high number of Bearded Pigs crossed the Bahau River from the west to the east for a period that lasted for more than one month. The same process occurred again during the mast fruiting of 2005.

The female pigs prepare nests of leaves and give birth to several piglets at a time. Major pig predators are the Clouded Leopard and Pythons, but most of all humans. Pigs are the favorite food of most people living in the vicinity of Kayan Mentarang. Their behavior and abundance make the Bearded Pig indeed one of the most important mammal species of Kayan Mentarang.

Bearded Pigs are migrating animals, and are under threat if their presence and migration routes are not taken into consideration during development planning. In plantation they will be seen as a pest. It is important that some of the bigger remaining forests in Borneo, like KMNP, are kept intact for such migrating animals - not only for the sake of the animals, but also for forest dwelling communities

BANTENGS (*BOS JAVANICUS*)

Bantengs are wild cattle that once occurred in most parts of Southeast Asia. Nowadays the distribution of these animals is limited to small populations scattered in Burma, Laos, Cambodia, Vietnam, Thailand, Java and Borneo, and many of the remaining wild populations have interbred with domestic cattle.

In Borneo, small herds of Bantengs are still present in Sabah, as well as in parts of South and East Kalimantan (Hedges & Meijaard, 1999). The grasslands of the upper Bahau in Kayan Mentarang National Park are possibly home to one of the largest populations of Bantengs. Occasionally, bantengs roam further to the south. They used to occur all the way to Long Alango but have now become rare because of hunting pressure. Three female Bantengs were seen by WWF staff as far south as the upper Pujungan area.

It is quite easy to see Bantengs in the Long Tua, where they usaually come out in the late afternoon and can then be seen grazing from a distance. Their favorite food are the young spouts that grow after the burning of the grass.

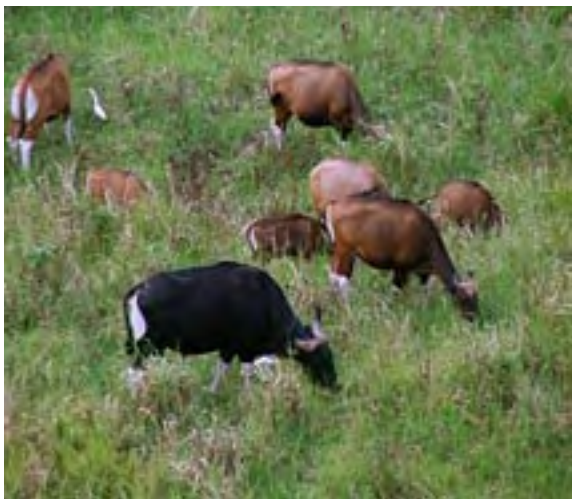
Banteng are easy to recognise in the forest: they are the largest mammals present here, and their footprints resemble those of Sambar Deer (*Cervus unicolor*), only larger. They have a rather clumsy way of running in the forest.

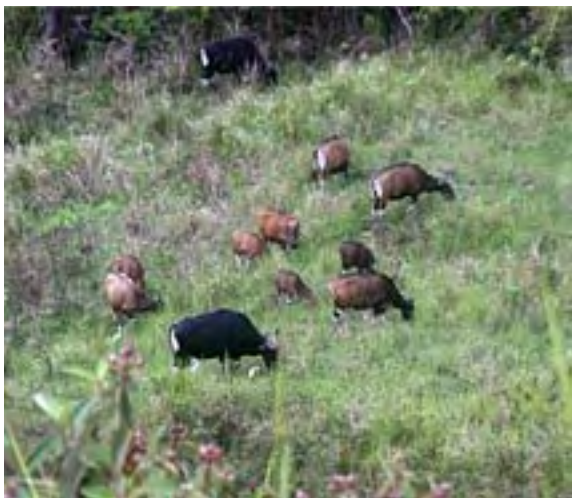
The female Bantengs are brown with white buttocks, and more or less the size of domestic cows. The male Bantengs are much larger and the colour of their coat is a dark brown to black color, with white buttocks. The young Bantengs, both females and males, are brown. A female usually gives birth to only one young at a time.

These animals are grazers and browsers, feeding on grasses, small plants and bushes. They can live in the forest but prefer the open areas. Grasslands in particular are very suitable habitats.

The present Banteng populations of the grasslands have a good chance of surviving into the future with the management support of local people.

Herds of Bantengs can be seen grazing in the grasslands of the Hulu Bahau area. The females are brown and the males are black





AN OVERVIEW OF WILAYAH ADAT TUBU

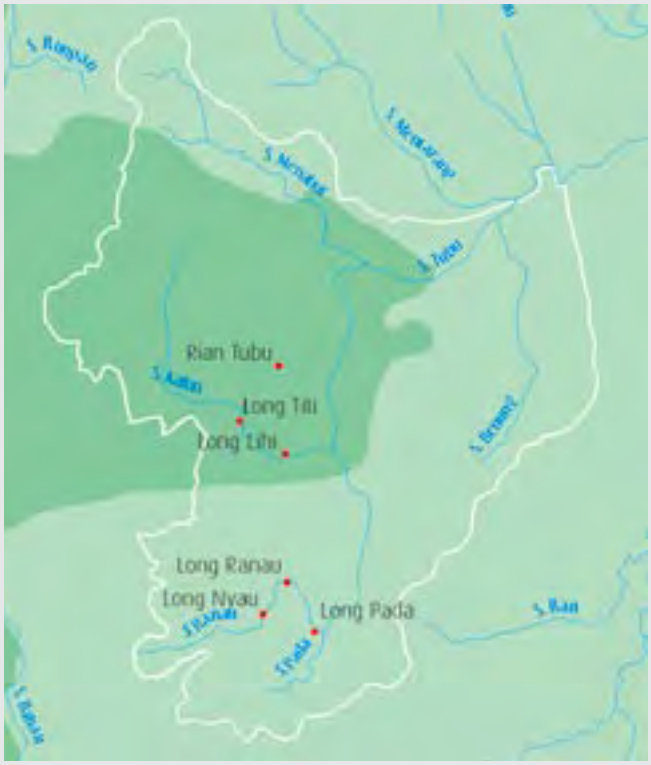
The formerly nomadic Punan people are the predominant inhabitants of *Wilayah Adat* Tubu in the Malinau district. Nowadays, the Punan Tubu live in three main areas: the Tubu watershed (seven villages and four small settlements), the middle Malinau (Kuala Ran, Sungai Ran and Bila Bekayuk) and in the two large resettlement villages of Respen Sembuak and Lubuk Manis in the vicinity of Malinau. The Tubu watershed is today exclusively inhabited by Punan.

As a consequence of a very low human density, with less than one inhabitant per square km, an almost continuous undisturbed primary forest dominates the landscape. Along the riversides, steep slopes with a mosaic of old regenerated forests offer proof of ancient human occupation.

Accessibility is the major constraint of this area. The Tubu River is navigable throughout the year only by means of small canoes equipped with long-tail engines, and only as far as Long Pada. Villages located further upstream or along the main tributaries of the Tubu such as the Kalun, Rian and Menabur rivers, are only accessible on foot.

The Punan - a patchwork of distinct groups

The Punan do not form one single ethnic group. *'Punan'* is a generic term which applies to all groups of hunters and gatherers of Borneo, while *'Dayak'* applies to groups of shifting cultivators. Historical factors caused strong differences among sub-groups of Punan in terms of dialect, social and economic



Costumary land area : Punan Tubu

Area size: 240.000 hectare

Administration : Mentarang Sub-district, Malinau District

Population : 571 permanently in Tubu Watershed in 2005

Major ethnic group: Punan Tubu

Major landscapes: Lowland and upland sedimentary ridges, narrow river valleys

Major forest types: Lowland Dipterocarp forest, hill Dipterocarp forest, riparian forest

Access : Chartered boat from Malinau

Previous page: A Punan woman working in her garden near the village of Long Titi, Tubu

situation, sub-ordination to overlords and behavior towards outsiders. Nonetheless, all Punan originate from groups of hunters and gatherers who probably started to open swiddens for upland rice cultivation only between the end of the 19th century and the middle of the 20th century.

The Dutch pacification of East Borneo since the late 19th century put an end to inter-group warfare and a headhunting tradition among Borneo peoples. The *pax neerlandica* opened the interior of the island to traders. With increased exchanges and less dependence on their Dayak neighbours as trading intermediaries, the Punan became more involved in the trade of forest products such as resins and gums, rattan, bezoar stones and *gaharu* or aloes wood. The adoption of shifting cultivation implied that the Punan put an end to their nomadic life, for at least during the rice-cropping season families had to stay in the vicinity of their swiddens.

The new Punan lifestyle was increasingly influenced by those of their Dayak neighbours, including the adoption of a more stratified social organisation divided into aristocratic families, free men and bondsmen, the payment of a bride price and the capitalisation of prestige goods (Chinese jars, copper gongs and, in more recent times, gold jewellery).

Trade and its shift from the coast to the interior played a key role in East Kalimantan's social and political change between the 17th century and the turn of the 20th century (Sellato 2001). The successive stages of the forest products' trade, and its shift from the coast to the interior, progressively built up the complex distribution of the Punan

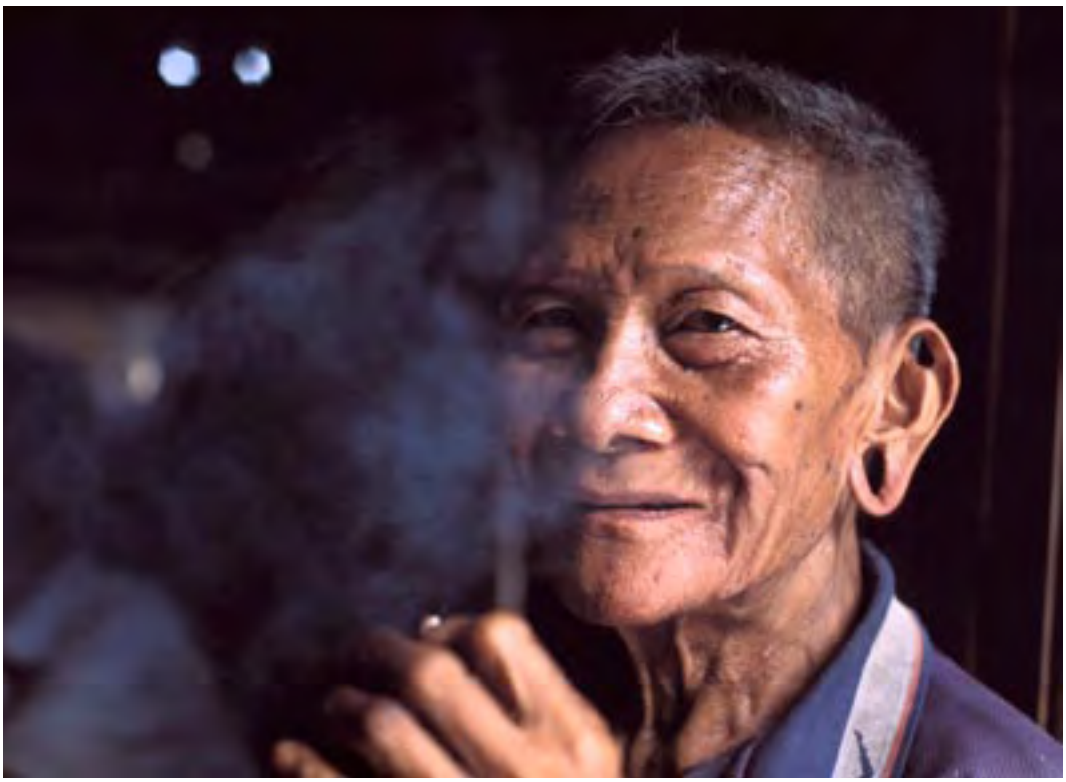
A Punan woman from Long Lihi is winnowing the rice with her bamboo tray

groups in the region and reshaped the distribution map of the Punan in the Malinau district.

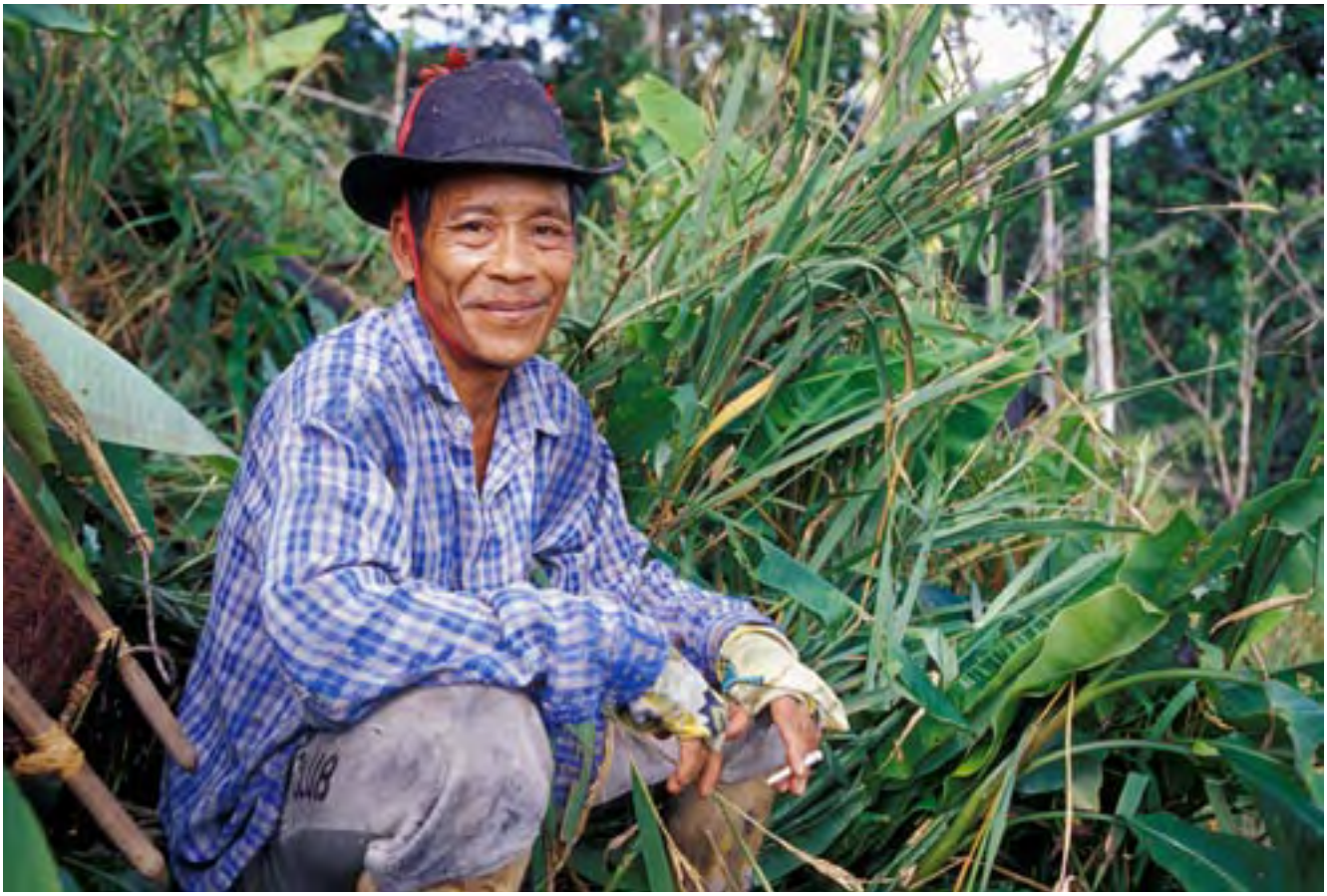
Although they share common cultural and technological traits, the Punan groups of the Malinau district are not linguistically related to their neighbours, nor do they share common origins. According to Kaskija (2002), the Punan groups may have occupied the upper Tubu since 1800 and migrations into the upper Malinau basin must have occurred around 1850. Four Punan Tubu sub-groups should be distinguished in the Malinau area, depending on the type of collaboration they established with Dayak groups:

- Punan of Malinau
- Punan of the lower Tubu (now mainly located on the Mentarang) who were affiliated to the Abai and also to smaller groups like the Milau, Mearu and Merap
- Punan of the middle Tubu who were long associated with the Tebilun (Abai), an open non-stratified and fluid ethnic group, from whom they adopted several features like the brideprice tradition
- Punan of the upper Tubu who had close links with the Merap

The Merap entered the Malinau-Tubu area from the West around 1880. For at least 150 years, the Merap have been the overlords of a large part of the Malinau and Tubu watersheds. This extremely stratified group did not allow intermarriages, which explains why the Punan of the upper Tubu and



A Punan man from Long Lihi with big ear holes. In the old days, this was normal decorative attribute among many ethnic groups in the Kayan Mentarang area. Today, this is a dying tradition, only seen among the elderly people in villages of the interior



A Punan man taking a well deserved break in between fieldwork, Long Titi, Tubu

Malinau remained nomadic much longer than other groups (Sellato 1993).

Cultural features of contemporary Punan Tubu

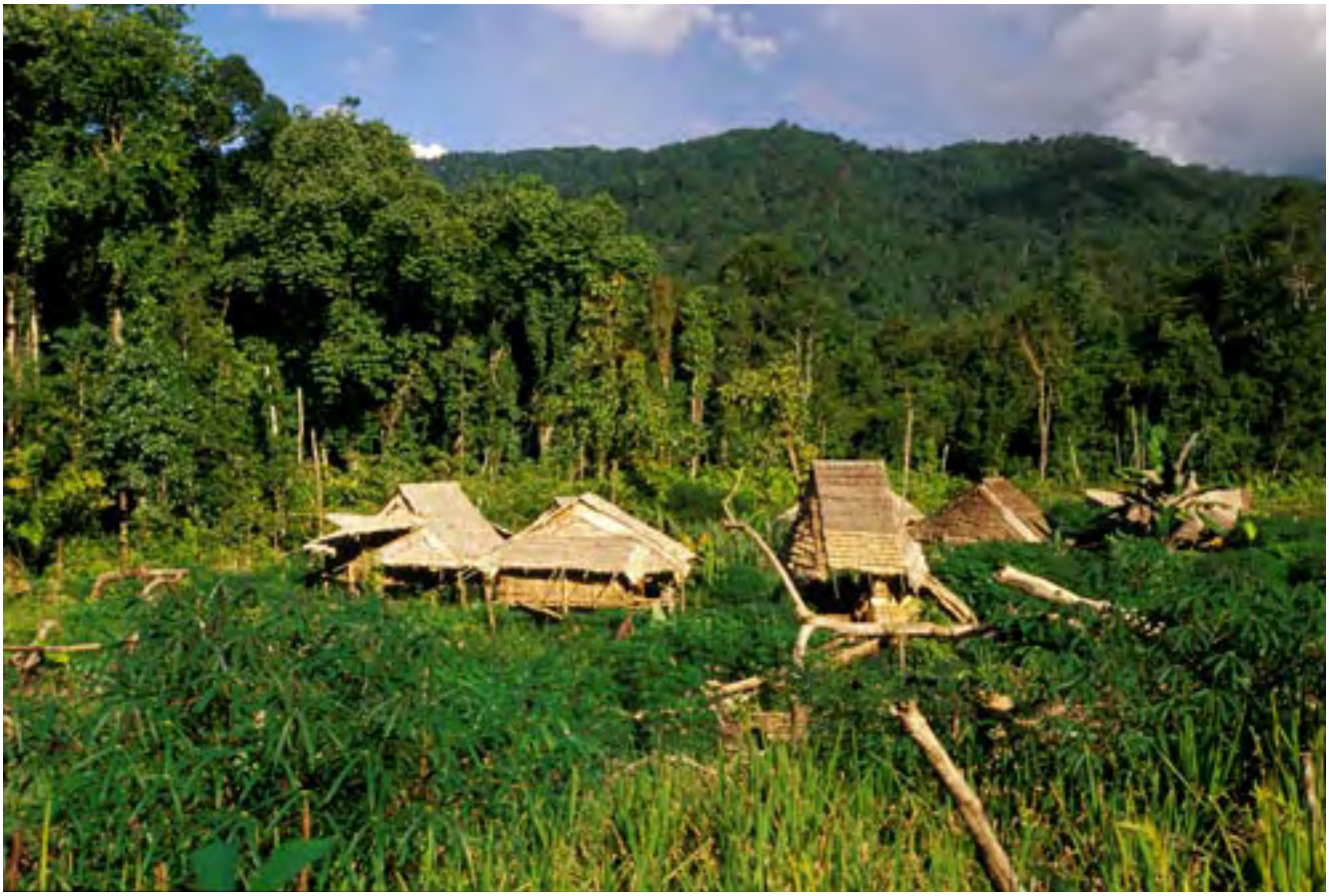
The history of the Punan has always been marked by continuous partnerships with other groups - although fluctuating and frequently renegotiated. Constant interethnic alliances are a cultural feature that affects the richness of a material life, which is predominantly based on belongings and tools borrowed from other ethnic groups. It is today nearly impossible to find any object in a Punan house that may be qualified as typically Punan. Some major cultural traits like the fact that the Punan would immediately leave their camp after the death of a member of the community are no longer in practice now that the Punan live in permanent settlements.

Silent barter, consisting of exchanging goods without having direct nor physical contacts with outsiders, was an efficient strategy against epidemics. Such cultural fence is now compromised by perennial settlements.

Today, the Punan suffer from emerging diseases - like measles and malaria - that their former nomadic lifestyle prevented them to contract. Their exceptional expertise on medicinal plants fails to provide them with efficient treatments against diseases that they did not meet before. Their advanced ecological knowledge of forest richness that used to offer access to a wide range of wild edible resources is less and less valued by younger generations. The high diversity of fruits and vegetables found in the forest are increasingly neglected in favor of manufactured - thus more exotic – snack foods.

Social features of contemporary Punan Tubu

The Punan Tubu are no longer nomadic, but seasonal mobility is still high. Individuals, with or without their family, can move temporarily or



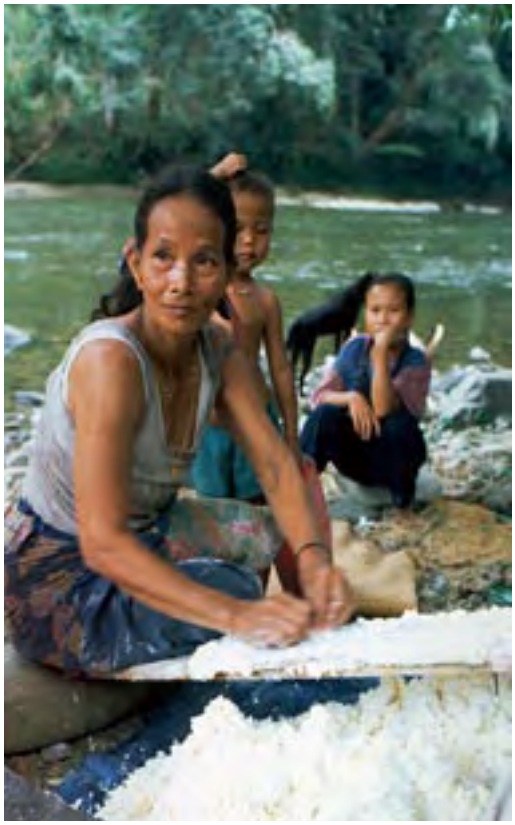
Some Punan Tubu live far upstream in small hamlets numbering only a few families. Here Long Titi, Tubu

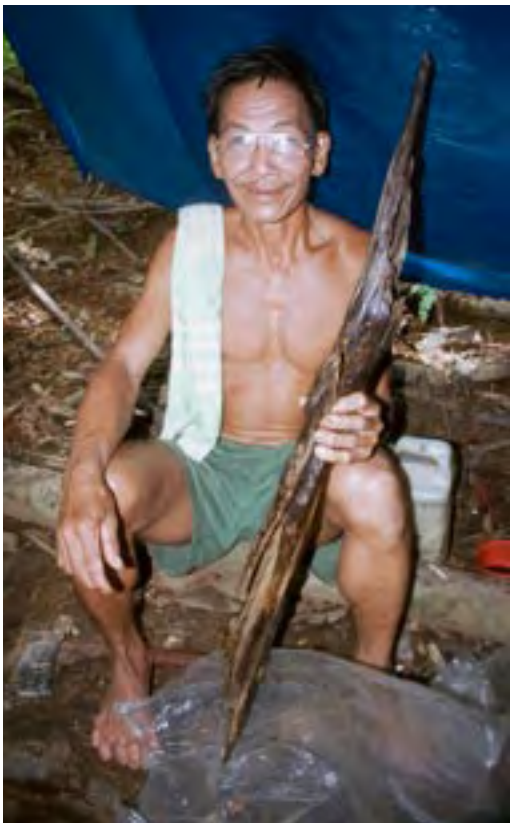
definitively from one settlement to another, or migrate to Sabah or Sarawak (Malaysia) for a month or a lifetime. Many small villages were resettled by the government in the 1970s and regrouped in larger settlements further downstream, closer to towns and services like Respen Sembuak and Lubuk Manis, or in the mid-stream of the Malinau river like Kuala Ran, Sungai Ran and Bila Bekayuk, near Long Loreh. In the resettlement areas, the Punan have become suburban farmers and benefit from all facilities of the city, and depend less on forest resources for their livelihood.

Some Punan Tubu remained upstream. They live all over the watershed scattered in small hamlets numbering six families in the smallest and up to 24 families in larger villages like Long Pada and Long Titi. By mid 2005, seven permanent villages and four recent and smaller settlements were present in the watershed. Their inhabitants practice upland rice swidden cultivation and although no longer nomadic, keep on going into the forest and collecting forest products on a seasonal basis. Their livelihoods are still highly dependent on forest resources. Altogether, 5,000 Punan live in the district of Malinau, where they represent less than 20% of the total population of the district, and nearly 1,000 stay far upstream (Sitorus et al. 2004).

The Punan Tubu are one of the poorest peoples in the Kayan Mentarang area. Some indications of this can be seen in the chart below. It can also be seen

Punan Tubu	Families	Persons	Illiteracy rate (%)			Child Mortality (%)
			Male	Female	All	
Tubu watershed	125	571	45.3	71.4	58.5	35.3
Malinau River	110	385	40.3	62.9	51.6	43.2
Resettlement	209	981	18.6	32.6	25.6	8.8





that the illiteracy rates and child and infant mortality are especially high in settlements located far from the city of Malinau. Life expectancy is short in all settlements, with less than 1% of the population over 65 years old.

Economic features of the Punan Tubu

The Punan Tubu present a mixed subsistence and cash earning economy, in proportions varying according to the location. From upstream to the vicinity of the city of Malinau, the Punan economy offers a range of activities combining rice farming, horticulture, subsistence gathering, extraction, fishing, hunting and off-farm activities (transport, guide, worker for mining and logging companies). The economy thus appears diversified and local intra-group variations in subsistence activities depend on political and historical causes of settlement and on remoteness from the market.

The Punan Tubu started to practice rice cultivation earlier than the Punan Malinau, who remained nomadic for a longer time (Sellato 2001). But the situation has reversed during recent decades. The Punan of the uppermost Tubu are nowadays the only inhabitants of the Tubu River, and appear more nomadic than the Punan Malinau who cohabitate on the river with diverse stratified groups of Lun Dayeh, Abai, Merap and Kenyah.

The households of the upper Tubu depend strictly on their swiddens for their staple food and on forest products for their cash earnings. The introduction of crops like rice and cassava has made

This and previous page: Daily village life in Tubu - sago processing, a gaharu collector, and a back from hunting scene with people gathered around a dead Sambar Deer

the traditional emergency food like sago virtually obsolete. Upland, and in some cases lowland, rice cultivation has become the most common activity in all settlements.

There is a huge heterogeneity in rice production between settlements and families, and only half of the households prove self-sufficient. Rice as the main staple food contributes to the majority of the meals. Cassava, taro and other cultivated tubers are alternatively consumed in case of seasonal shortage of rice. Sago contribution to the households' diet is nil in villages well connected to the market, but still significantly contributes to the diet in the remotest villages of the upper Tubu.

In the remotest settlements, a large majority of households sell chicken to visiting traders, as they prefer to rely on bush meat for their own protein intake. Fish and bush meat have always been the main source of proteins for the Punan Tubu and wild boar meat is by far the Punan's favourite.

Forest products collection concerns a large percentage of households, with *gaharu* collection still the Punan's major cash-earning forest product. Collection involves three households out of four in remote and very remote settlements, and makes up about one third of the families' total cash income.

Up until now, the difficult access of the upper Tubu naturally prevented the area from being logged and mined. In contrast to other watersheds, up until the present, concessionaires have had a very limited impact on the economic situation and development of this area.

CHANGING PERCEPTIONS OF THE FOREST AMONG PUNAN TUBU CHILDREN

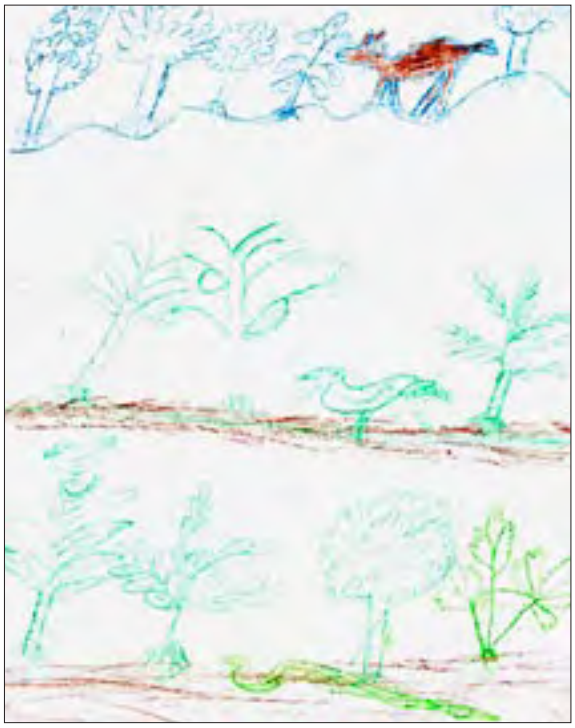
Drawing analysis is a tool commonly used in psycho sociology to approach the representational universe of children. Children's drawings give us information on the social category they form, and on the society as a whole in which they develop. A drawing is a message that speaks, narrates and explains much of what children do not yet know how to express verbally.

A group of social scientists from the Center for International Forestry Research (CIFOR) and the French Institut de Recherche pour le Développement (IRD) examined drawings of the forest done by two separate groups of Tubu Punan children: one group living in a remote forest settlement and the other living near the fast developing town of Malinau. Children's drawings say a lot about how they perceive the world around them. Independently of the cultural context in which they grow up, young Punan from the city develop a different perception of the forest, from that of their village counterparts because their experiences diverge.

In town, animals are much scarcer than in the forest. In the imagination of city children, farmland has replaced the woods with which they have but few links. Contrary to the drawings of the remote village children, the forest elements in the city children's drawings have negative, dangerous, even sinister overtones. As the woods are not part of their daily life, their perception of wildlife is expressed through exotic or extraordinary animals.

For the remote village children, animals in a forest background are always drawn with great attention to details so that it is possible to recognise the different species. The perception of the forest which emerges from their drawings is positive, or at least utilitarian. The animals drawn are an integral part of the nourishing forest in which these children grow up.

Beyond their artistic value, the Punan children's drawings reveal the social changes and dynamics that are affecting Punan communities. Punan people have given up their nomadic habits and might be growing up further away from the forest. The drawings call our attention to the uncertain future of tropical forests and the role of Punan communties.



AN ECO-CULTURAL KEYSTONE SPECIES: THE BEARDED PIG IN PUNAN SOCIETY

The Punan hunters know how to decipher numerous ecological pointers in order to anticipate pig migrations and organise their hunting expeditions accordingly. Furthermore, they have a large range of hunting techniques at their disposal. Ambushes on river banks to surprise the pigs during their crossing, and hunting with hounds are collective methods which turn out to be very productive. Depending on the season, the pig represents between 47% and 83% of the game taken. Between December 2001 and June 2003, pig meat consumption per capita in the remote Tubu watershed wavered between 143 and 387g per day. These numbers might award the Punan first place as the biggest meat eaters on the planet.

The wild boar is the only mammal to have a beard and mustache, considered human attributes. Its meat is the object of regular ritual manipulations and is ostensibly consumed on all festive occasions. In more belligerent times, the sacrifice of bearded pigs sealed war pacts made with the numerous stratified Dayak societies. Such persistent interethnic partnerships up to the end of the 19th century served to secure the territorial access to non-timber forest products of high monetary value. For instance, the Punan were in charge of collecting forest products for their partners, watching over bird nest caves and tracking down outside professional collectors. In return, they obtained rice and political protection as well as open access to lands that were controlled by their Dayak associates.

The wild boar is admired by the Punan for having very few natural predators, and for having woven partnerships with other animals. For example, when it eats fruit, it leaves large amounts of debris in its wake, which are prized by the Red-eyed Bulbul and the Crested Wood Partridge. In exchange, these birds act as watch guards, warning the pigs in case of danger. This propensity to collaborate with other animals and the absence of predators justify its attributes as a mediator and messenger with the supernatural world. The most feared spirit of the Punan pantheon takes on the appearance of a "white" pig, leading migrant hordes. Its function is to mediate between men and the gods, dispensers of resources.

In these times of rapid change, it is becoming crucial to draw the attention of decision makers to the fact that the conservation of the bearded pig, durable exploitation of the Dipterocarp forests and the preservation of Punan knowledge and culture are all intertwined. Traditional ecological knowledge is often expressed through the prism of symbolism although it is often rooted in very careful naturalist observations. This knowledge can still be of relevance in sustainable resource management. The bearded pig can be a benchmark species for analysing ecological change in Borneo.

Hunting dogs waiting for their reward

The tastefull *Pelian* fish is an important food source for many local communties in KMNP

AN ECOLOGICAL OVERVIEW OF TUBU

The Tubu area is one of the few areas of Kayan Mentarang covered by extensive lowland and hill Dipterocarp forests, with most of these forests still in primary condition. The forests of the Tubu area are extremely rich in tree species, and several of the Dipterocarp species that are found in this area are rarely encountered in other areas of Kayan Mentarang.

The Tubu area is composed mainly of sedimentary mountain ridges and hills, with the base material consisting of sandstone and siltstone. Metamorphic formations surface only in the easternmost part of the Tubu area. The base material here consists of schist.

The highest mountain ridges occur in the western part of the Tubu area. They reach elevations of more than 1,200 metres and form the watershed between the Sesayap and the Kayan/Bahau drainage areas. Most of the Tubu landscape, however, is composed of lower ridges with steep slopes, dissected by a high number of small river valleys. The ridge formations follow very random directions and travellers can easily get lost when trying to follow the ridges. The safest way of orientation in this area is therefore the rivers.

The major rivers of the area are the Tubu River and its tributaries, the Menabur River in the north, and the Kalun River in the southern and central parts. The Kalun River, in particular, has many small tributaries flowing from the mountains. These streams are generally tranquil and shallow with crystal-clear water. Occasionally, waterfalls interrupt the course of the streams at sites where they drop from steep slopes.

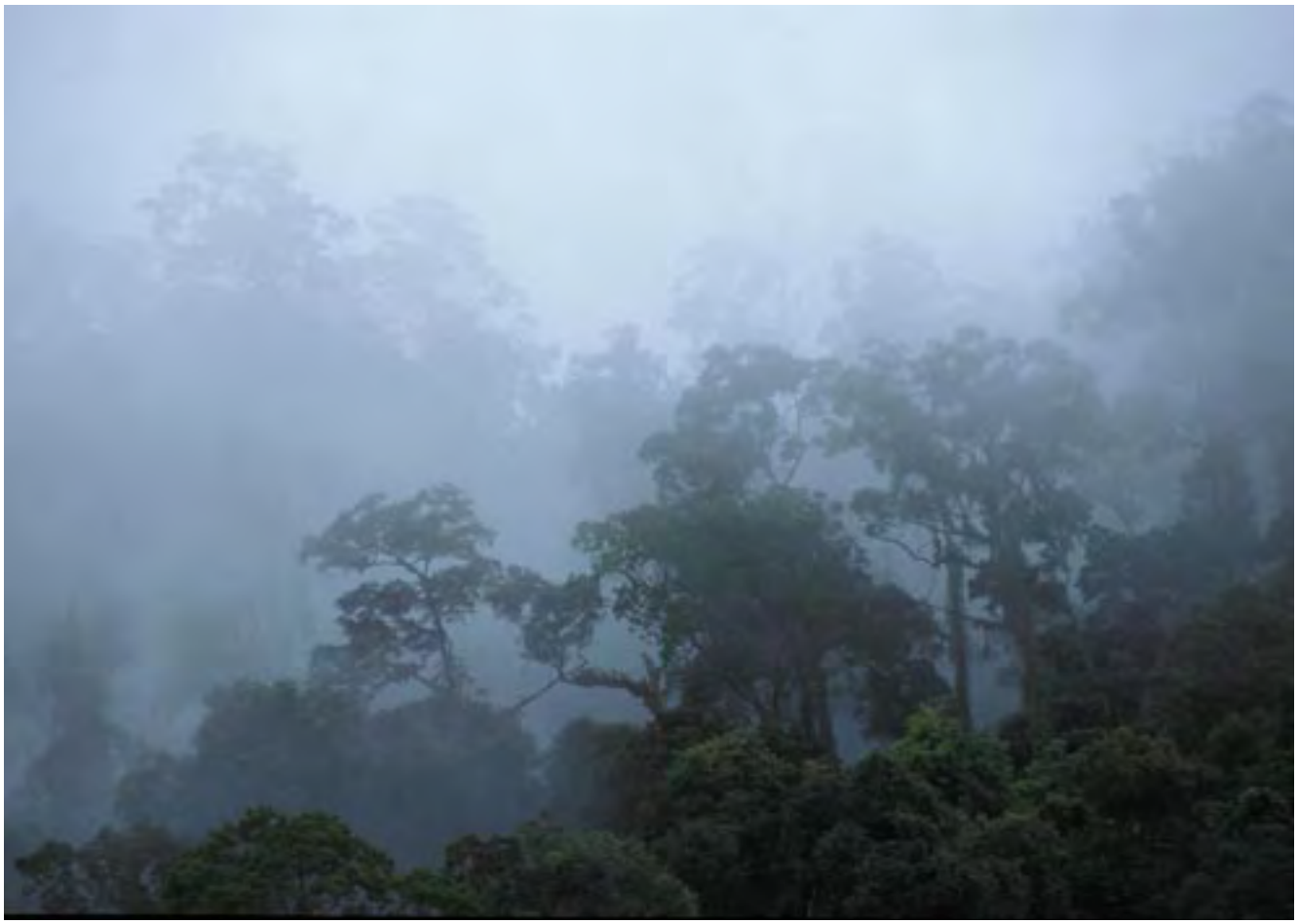
The forests growing on the lower ridges and in the narrow river valleys are extremely well developed, with many big trees and very high species diversity. This is quite remarkable given that the soils of the Tubu area are not very fertile. The lack of human disturbance and anthropogenic encroachment definitely contributes to the magnificent way that the structure and diversity that these forests have developed.

The forest structure consists of an overall canopy with many giant Dipterocarp trees emerging from it, which commonly reach heights of 50 meters or more. They are impressive trees with very large diameters, often supported by large buttresses. The major species are the Red Merantis, such as *Shorea parvifolia* and *Shorea parvistipulata*, and the Yellow Meranti (*Shorea acuminatissima*). The latter species is found mainly in the vicinity of rivers, while the Red Merantis can be found scattered in most areas, including the higher slopes. Other large Dipterocarps include Merawan (*Hopea beccariana*) and White Keruing (*Dipterocarpus caudiferus*).

The crowns of Endospermum peltatum trees (Euphorbiaceae) often stand out in the forests of the lower slopes. These trees develop very large buttresses that are sometimes harvested by local people without cutting down the tree. Very large *Litsea* trees can be found scattered throughout the forests. These very old trees are usually covered with lianas, mosses and epiphytes. Giant *Agathis* trees are found at the upper slopes of the mountain ridges, their protruding crowns often visible from a distance. Large *Palaquium* trees, which produce a white resin formerly collected for the *gutta percha* trade, are common on the ridges.

The highest tree species diversity occurs in the lower canopies, where hundreds of species can be found. Some of the most common species belong to the genera *Lithocarpus*. These so-called "tropical Oaks" abundantly grow in these forests dominated by Dipterocarps, and can occasionally reach relatively large sizes as well.

Species from the Canarium family (Burseraceae), the Langsat family (Meliaceae) and the Nutmeg family (Myristicaceae) are much more common here than they are in other areas of Kayan Mentarang. Trees that produce edible fruits can occasionally be encountered, and if one is really lucky, it is possible



Trees in the mist in Tubu

to come across a wild Durian tree... only to find out that all the fruits have been already eaten by monkeys or bears.

Many interesting small plants can be found on the forest floor of the Tubu area. A specific feature of this region is the occurrence of many small marshes on the river terraces in the narrow valleys, where several uncommon plant species can be found. These marshes also serve as a habitat for many snake and frog species. Small leaf- and tree frogs, which are rare in other areas, can easily be observed here.

The Tubu area in general has a large population of primates, with Grey Leaf Monkeys, Macaques and Gibbons found in most places. Pigs and deer can frequently be seen or heard. Civets are not very shy here and can be seen in the close vicinity of forest camps. Typical lowland squirrel species are rather common at the lower slopes of the ridges.

Another characteristic trait that distinguishes the Tubu area from other areas of Kayan Mentarang — apart from the extensive Lowland and Hill Dipterocarp Forests — is the high number of lowland animal species, particularly bird species. Many bird species can live only in habitats at lower elevations, and the Tubu area is home to several bird species not found in other areas of Kayan Mentarang, including several interesting Pheasant, Bulbul and Flowerpecker species. One species of Hornbill, the Pied Hornbill (*Anthracoceros albirostris*), can be found only here. The rare and globally endangered Storm's Stork (*Ciconia stormi*) is reported from a few riversides of this area.

Insect diversity of the Tubu area is also overwhelming. This area might well be the most diverse part of Kayan Mentarang in terms of invertebrates, although many of these still await discovery.

DIPTEROCARPS (DIPTEROCARPACEAE)

The big trees of the Dipterocarpaceae family dominate most of the lowland rainforests of Borneo. Many of the species have straight, erect stems and attain considerable heights. Giant Dipterocarps protruding from the canopy of the forests of Kayan Mentarang National Park can be easily spotted when flying over the area. Dipterocarps are particularly dominant in the valleys and other lowland areas of Kayan Mentarang. They are also common in hilly areas with fertile soils, but only a few species are found in the higher mountain areas.

Many Dipterocarp species in this area have mast fruiting periods during which many trees are fruiting simultaneously, followed by long periods of several years during which hardly any fruits are produced. The fruits are furnished with rather long "wings": *Dipterocarpus* and *Hopea* fruits with two wings, *Shorea* fruits with three and *Dryobalanops* fruits with five wings.

The Dipterocarp species that is most often seen by visitors to Kayan Mentarang is definitely *Dipterocarpus oblongifolius*. This species grows along the riverbanks of nearly all the large rivers of the area. Large trees have their branches extend out from the banks over the water and are covered with many species of epiphytes. These days, farmers opening a rice field along a river would often cut down these trees whereas in the past they did not. The most common Dipterocarp of Kayan Mentarang is probably *Shorea parvifolia*. This elegant species has a reddish, fissured bark. It can be found on many valleys and lower slopes of Kayan Mentarang.

Shorea curtisii is one of the few Dipterocarp species found in the mountains. It typically grows on mountain ridges with fertile soils, where it can be the dominant species in certain spots, often in association with *Agathis borneensis*. The most common *Hopea* species of Kayan Mentarang is *Hopea beccariana*. This species occurs scattered in hilly areas and can obtain impressive sizes.

Dryobalanops trees are found in only a few locations of Kayan Mentarang. These trees have dark greyish barks with many loose flakes.

Other Dipterocarp taxa are only occasionally encountered in Kayan Mentarang.

The "long winged" fruits of a dipterocarp. When ripe they will fly though the air like the spinning blades on a helicopter