



# Gene pool in Sarawak

**Lanjak Entimau Wildlife Sanctuary in Sarawak is a hotspot of biodiversity. Project consultant Dr. Paul Chai is happy to explain the values of Lanjak Entimau and its benefits for human welfare and human well-being.**

Ten questions to Dr. Paul Chai, project-coordinator of conservation and community-development in Lanjak Entimau Wildlife Sanctuary.

**1. Which ecosystems occur in the Lanjak Entimau Wildlife Sanctuary?**

The sanctuary is ecologically complex with eight distinct ecosystems or forest types. Ecosystem characteristics are chiefly determined by variations in soil and climatic factors, exhibiting distinct differences in structure and species composition. The mixed dipterocarp forest is the richest and most extensive ecosystem and occupies up to 65% of the sanctuary. The forests

are a collective gene pool of biodiversity and important water catchments that are largely undisturbed by human activities. Lanjak Entimau is the largest of 33 Totally Protected Areas (TPAs) in the State and contains Sarawak's only viable population of orang-utan of some 1,500 individuals. It is also the only TPA where populations of endangered primates of white-fronted langur, red langur and Bornean gibbon have been studied and estimated, with populations of 20,000, 36,000 and 25,000 respectively. Seven of Sarawak's eight hornbill species also live there, in addition to many other threatened species. It is also the richest habitat for herpetofauna and fish. The number of vascular plants alone is estimated at 2,000 species – so far the highest among the TPAs, with many rare and endemic to Borneo and the sanctuary.

**2. What are the values and benefits of the ecosystems?**

As a totally protected area, the sanctuary serves as a gene pool for numerous plant and animal species. The local Iban people see the forest still as a spiritual home, as their ancestors did before them. Hunting, fishing and the collection of forest produce are a traditional way of life and help to bring in cash income. There is a wealth of non-timber forest products, including food and medicinal plants.

The sanctuary constitutes the only sizable undisturbed primary forest in south-east Sarawak. Located in the headwaters of the Batang Lupar and Rajang rivers with a total of seven major tributaries (the Rajang is Sarawak's longest river), the sanctuary occupies two main watersheds that are divided into three major and four minor drainage blocks. This allows some 40% of Sarawak's total population of 2.2 million to enjoy potable water supply by rivers that originate in Lanjak Entimau Wildlife Sanctuary; the rivers also serve as water roads. The Batang Ai Hydro Dam located to its south is also largely sustained by the sanctuary's catchment supply. The electrical power is enjoyed by the people living in the capital city of Kuching and surrounding towns.

**3. Are there sellers and buyers of ecosystem services in the area?**

Presently, the Batang Ai Hydro Dam is the only service that generates revenue for the government.

**4. What about payment for conservation of hydrological services that guarantee the supply of stable flows of water of good quality for domestic and perhaps commercial use? What about payment for carbon sequestration?**

The hydro is a government project which is financed by the

## LOCAL PARTICIPATION IN CONSERVATION MANAGEMENT WORKS

In a joint project lasting from 1993 – 2011, the Sarawak Government, the Forest Department Sarawak and the International Tropical Timber Organization ITTO have enhanced the protection of the biodiversity hotspot Lanjak Entimau Wildlife Sanctuary (about 200,000 ha) in East Malaysia's state of Sarawak on the island of Borneo, engaging the local Iban people. Lanjak Entimau is a jewel with many facets. It is a treasure trove of biodiversity and a gene pool of global significance. Its sources and rivers provide water of good quality to 40% of Sarawak's total population of 2.2 million. A hydro-power station uses the sanctuary's catchment supply to provide the people of the capital of Kuching and surrounding towns with electricity. The planting of fruit trees and new fish farms make the Iban people living in the periphery less dependent on the forest. They can continue to live in the forest which also has spiritual meaning to them. The local people are the 'eyes' and 'ears' of the project managers. Mutual interest: keeping illegal activities out. The concept of local participation in conservation management has been introduced, it works. The management of Lanjak Entimau has been improved and both the local Iban people and a large part of the population of Sarawak benefit. The project has been supported financially by ITTO and the donor countries Japan, Switzerland and the United States of America. The Forest Department Sarawak will continue to take it further. In an early stage of the project - 1994 – the Trans-boundary Biodiversity Conservation Area (TBCA) of Lanjak Entimau Wildlife Sanctuary and Betung Kerihun National Park in West-Kalimantan, Indonesia was established.

government, and is managed by a government agency. Forests are also government-owned. The government does not pay for hydrological services to any community or private land owners. No payment for carbon sequestration.

**5. Lanjak Entimau Wildlife Sanctuary is a treasure trove of biodiversity. Are you going to use it as a gene pool for scientific purposes and/or as a commercial gene bank?**

It is to be primarily a gene pool for scientific purposes, but its rich timber stock can potentially serve as a gene pool for reforestation work if necessary. The ITTO project conducted a study on gene pool during phase II.

**6. Is restoration of ecosystems necessary inside or outside the area?**

As the sanctuary is protected and free from disturbance, no restoration is necessary. However, due to depletion of timber and other forest resources in the surrounding forests that have supported the local communities' needs, it has been proposed that idle land outside the protected area should be planted with economically important timber and fruit tree species for the people to use without affecting the sanctuary's resources. The Forest Department Sarawak through its Community Service Initiative Unit, has already implemented such an activity, and will continue to expand the planting in the coming years.

**7. What are the obstacles and what are the opportunities for ecosystem conservation and restoration?**

The opportunity for ecosystem conservation is immense, especially if the entire Transboundary Biodiversity Conservation Area (TBCA) of Lanjak Entimau and Betung Kerihun N.P. in West Kalimantan, Indonesia (total 1.2 million ha) is taken into consideration. Managing such a huge area will require continuing funding and qualified manpower from both sides. Access is a big problem due to difficult terrain and absence of a road. More cooperative effort from the two governments will be needed if the biodiversity of the TBCA is to be adequately safeguarded. In the past, ITTO was able to act as the 'middle man' or catalyst for collaboration as it funded both the projects. The Betung Kerihun project was discontinued in the mid-1990s.

The sanctuary shares common borders with several timber license areas, and is surrounded by numerous settlements, including those across the international border. Competition for resources could pose a potential threat to the sanctuary. Enforcement must be made effective. Awareness education will help. Restoring idle land also requires funds and good manpower.



Dr. Paul Chai

Much of the cost will be for travel, transport, monitoring and staff allowances which have to come from the government. The Lanjak Entimau project has demonstrated that strong political support and leadership are catalysts for success and sustainability. Local communities' roles in protected area management and strengthening resource utilization must be recognized.

**8. Who are the beneficiaries of ecosystem conservation and restoration in the area?**

Ecosystem conservation is a policy of the government to maintain a balance between protection and commercial use, for the assurance of sound climatic and physical conditions, and the safeguarding of soil fertility and supply of water for domestic and commercial use, as stated in the Forest Policy. If the entire Transboundary Biodiversity Conservation Area is considered as a contiguous ecosystem landscape, these benefits also extend to the government and people of West Kalimantan in Indonesia.

For many generations, the local Iban people have depended on the forest for food, materials, medicine, and other less known non-timber forest products like dyes and cosmetics; and also as their spiritual home. Some forest has been cleared for shifting cultivation of hill paddy in the past, but the rest has remained intact. The local Iban people will directly benefit from restoration projects, but restoration is also good for ecosystem conservation as the people would not have to go to the protected forest to get timber and other supplies. Some 12,000 local Iban people in 1,000 longhouses are still dependent on Lanjak Entimau in one way or another.



Kelabit women pounding paddy.

WILHELMINA CLUNY



ITTO

Some 40% of Sarawak's total population of 2.2 million enjoy potable water supply provided by rivers in Lanjak Entimau Wildlife Sanctuary. The rivers also serve as water roads.



A Penan girl weaving a basket, Pulong Tau N.P.



Edible fruit durian (*Durio zibethinus*).

#### 9. What were the goals, objectives and results of the project?

The project had the objective of developing the Lanjak Entimau Wildlife Sanctuary as a totally protected area for nature conservation and as a site for biological research. Specific objectives were

- 1) to conserve Lanjak Entimau through a locally based program of research into its biological diversity and other aspects of its living resources; and
- 2) to establish protection programs for the sanctuary through community consultation and community-oriented biodiversity resource development in the surrounding buffer zone.

The project conducted baseline studies on geology and soils, forest ecology and biodiversity (flora and fauna), socio-economy and environmental education. Additional scientific information was obtained through the joint scientific expedition to the TBCA in 1997. Local participants in community development activities involving fish culture and indigenous fruit tree planting have been able to enjoy additional cash income. It has also reduced their



PAUL CHAI

Kandis or wild mangosteen with edible fruits (*Garcinia myristicaefolia*).

dependence on the forest. Environmental education has made them more aware of the importance of ecosystem conservation and many are beginning to help safeguard the sanctuary by preventing outsiders from coming in to fish and hunt. The project has made efforts to maintain transboundary cooperation with Betung Kerihun and has organized joint task force meetings, a work shop and several site visits to the sanctuary for the officials and community leaders from Betung Kerihun. Overall, the development and specific objectives of the project have been met. As a result of the project, the government established a center for orang-utan research and another one for plant research several years ago. In 2011, the Forest Department Sarawak formed the Community Service Initiative (CSI) unit to continue the work of ITTO in Lanjak Entimau.

#### 10. What has motivated you personally to do this job for so long?

I have been involved in research and conservation work most of my career, and believe that this important work must continue as there is a need to maintain a balance between development and conservation. The Lanjak Entimau project provided an excellent opportunity for me to contribute what I have learned, and to train young people to be interested in research.

[www.itto.int](http://www.itto.int) Then search for Lanjak Entimau

#### TESTIMONIALS



Anthony Bau, a retired school teacher, is a community leader. 'Thank you for making an improvement to our livelihood. It is now easier to earn a living. The fish in the rivers have also recovered.'



Rejang anak Sugai from Anthony Bau's longhouse: 'Community relationships have improved since we began to work together. We have saved enough money to upkeep our fish pond and continue with fish farming. I am thinking of building my own pond.'