

to 200,000 ounces in 2005 and to nearly 400,000 in 2007. Total reserves of gold are estimated at 2.09 million ounces.

Production of copper from their Khanong mine located in Xepon District is expected to start in the first quarter of 2005. A production plant with a capacity of 60,000 tons per year is currently being build at the site. The Khanong mine is estimated to contain 1.21 tons of copper. The Power System Development Plan from 2004 has included the production plant's energy need in their in their demand forecast, amounting to 40 MW from 2005.

The social and environmental impacts of the copper mine and the production plant are expected to be considerable. The Environmental Impact Assessment for this project is presently under review by STEA.

## 9 CONSERVATION

### 9.1 Regional Perspective

#### 9.1.1 *Biodiversity values*

The Lower Mekong region is uniquely rich in biodiversity due to its position as a "bridge" between the Asian continent and the Indo-Malayan bio-geographical regions and the rather isolated and sparsely populated areas in Cambodia, Lao PDR and Vietnam. According to the International Union for the Conservation of Nature (IUCN) Cambodia and Lao PDR have the highest species density in Southeast Asia, whereas Thailand, Myanmar, and Vietnam are highest in species endemism.

For example, 10 percent of the world's mammal, bird, and fish species are found in Vietnam and 40% percent of the 12,000 local plant species are endemic. Vietnam's forests contain the highest bird and primate diversity in mainland Southeast Asia. The recent discovery of new species of large mammals in the border area between Lao PDR and Vietnam (including Nakai Nam Theun NBCA) reinforce the global significance of the country's rich biodiversity. The most prominent species discovered in the 1990ties are the ungulates Saola and Giant Muntjac. Other new mammals have also been observed but their validity as new species are still to be confirmed.

The rate of species and habitat loss is however, high in the region. In particular in Thailand and Vietnam there have been large changes in land use causing significant loss in natural vegetation and consequently of biodiversity. In addition there are severe problems with logging and illegal hunting and wildlife trade in the region.

The fish biodiversity is also unique. It is estimated that about 1300 different fish species are found in the Mekong Basin. Several of these are endemic and globally threatened.

#### 9.1.2 *Nature protection*

##### Lao PDR

Lao PDR biodiversity is protected through the establishment of 20 protected areas, called National Biodiversity Conservation Areas (NBCAs), comprising 12-14 percent of the total land area.

### Thailand

The government of Thailand has taken measures to conserve the biodiversity by establishing protected areas. Two acts have formed the basis of Thailand's conservation strategy: the Wild Animals Reservation and Protection Act (1960) and the National Park Act (1961). The first national park was established in 1962 and presently there are 77 national parks covering an area about 4 million hectares.

### Cambodia

In 1993, a new National Protected Area System was established in Cambodia, giving the Ministry of Environment authority to supervise, develop, and manage areas totaling more than 3 million ha in cooperation with the Ministry of Agriculture. The new system designates seven national parks, nine wildlife sanctuaries, three protected landscapes, and three multiple-use management areas.

The conservation efforts have helped to reduce habitat destruction from logging and other unsustainable use. The management capacity has, however, been slow to develop and has not been able to halt illegal logging.

### Vietnam

In 1997, the Government undertook to increase the number of terrestrial protected areas from 87 to 101 and to increase the size of most units. This initiative would increase the total area from 1.1 to 2.2 million ha, amounting to 6 percent of the country. Vietnam has made progress in protected area management. Management boards have been established for 10 national parks and, over the past 10 years, management plans for parks have increased from 20 to 44.

## **9.2 Lao Perspective**

Lao PDR is endowed with an unusually rich biological diversity. The high and isolated mountains have created wide variations in climate, soils, and ecological niches, leading to locally adapted and diverse fauna and flora.

Biodiversity is protected through the establishment of 20 protected areas, called National Biodiversity Conservation Areas (NBCAs) (Table 22). The protected areas comprise 12-14 percent of the total land area. The establishment has been based on criteria developed by the IUCN. Twelve of the NBCAs have received international funding support to establish integrated management plans for the protected areas.

In addition to the centrally designated protected areas, large areas have been designated as protection or conservation forests at the provincial and district levels, some to be upgraded to official protected area status in the future. Together, the protected areas and the provincial and district conservation and protection forests cover 8 million ha.

*Table 22: National Biodiversity Conservation Areas in Lao PDR (DoF 2000)*

Name of NBCA		Year	Area (ha)	Provinces covered
Dong Amphan	DAP	1993	200,000	Attapeu, Xekong
Dong Hua Sao	DHS	1993	110,000	Champassak
Dong Phou	DPV	1993	197,000	Savannakhet
Hin Namno	HNN	1993	82,000	Kammouan
Nakai Nam Theun	NNT	1993	353,200	Kammouan, Bolikhamsay
Nam Et	NET	1993	170,000	Houaphan
Nam Ha	NHA	1993	222,400	Luang Namtha
Nam Kading	NKD	1993	169,000	Bolikhamsay
Nam Phui	NOI	1993	191,200	Sayaburi
Nam Xam	NXM	1993	70,000	Houaphan
Phou Daen Din	PDD	1993	222,000	Phongsaly
Phou Hin Phoun	PHP	1993	150,000	Kammouan
Phou Khao Khouay	PKK	1993	200,000	Vientiane, Bolikhamsay, Xaisombun
Phou Loei	PLI	1993	150,000	Houaphan, Luang Phabang
Phou Phanang	PPN	1993	70,000	Vientiane
Phou Xang He	PXH	1993	109,900	Savannakhet
Phou Xiang Thong	PXT	1993	120,000	Champassak, Salavan
Xe Bang Nouan	XBN	1993	150,000	Salavan, Savannakhet
Xe Pian	XPN	1993	240,000	Attapeu, Champassak
Xe Sap	XSP	1995	133,500	Salavan, Xekong
<b>TOTAL</b>			<b>3,313,596</b>	

The Lao PDR has until recently been sheltered from many of the forces acting to reduce biodiversity. However, as the economy of the Lao PDR expands this situation is changing rapidly and threatens the country's biodiversity resources.

Most plans and initiatives in terms of biodiversity conservation come from national authorities. GoL has officially devolved responsibility for national policy implementation to provincial governments and relevant agencies. Even though government agencies like STEA have provincial offices, they are mainly carrying out tasks that have been outlined in national plans and strategies. However, a major problem is the lack of awareness and support for biodiversity conservation among the local population. Without such support it is difficult to enforce the protection and management principles developed by central and provincial authorities.

### 9.3 Local Perspective

In Kammouan, Bolikhamxay Savannakhet there are altogether 8 NBCAs. 5 of these are located to the catchments of Nam Kading and Xe Bang Fai. These include:

- Nakai Nam Theun NBCA, 353,200 ha
- Phou Hin Phoun NBCA, 150,000 ha
- Nam Kading NBCA, 169,000 ha
- Hin Namno NBCA, 82,000 ha, and
- Phou Xang He NBCA, 109,900 ha

#### Nakai Nam Theun NBCA (NNT)

The NNT NBCA is situated on the upper reaches of Nam Theun, between the Nakai Plateau and the border with Vietnam. This is the largest NBCA in Lao PDR and contains the most diverse combination of natural forest. Its biodiversity is unique and contains at least 3 of the 5 large mammals discovered worldwide in recent years. Two corridors have been established, one to connect the NNT with the Phou Hin Phoun NBCA to the west and another, smaller corridor to connect NNT with Hin Namno NBCA to the south.

Plans exist to extend the NBCA to the north as a largely undisturbed forest area consisting of about 450 km<sup>2</sup>, has been gazetted as the *Nam Chat/Nam Pan Provincial Conservation Forest*. The NT2 Project will provide the Nakai-Nam Theun NBCA with annual funds of US\$ 1 million. This will be an important contribution in order to protect this globally important NBCA against further encroachment from loggers and poachers.

#### Nam Kading NBCA (NKD)

The protected area covers the mountainous areas in the lower part of the Nam Kading catchment. For biodiversity values it is ranked as being of medium/high importance, primarily because of the mountainous evergreen forest. Forest corridors linking NKD with the Kammouan Limestone – Nakai Nam Theun complex to the south have been proposed. A buffer zone with authorized sustainable local use but with a ban on commercial logging is being planned.

#### Hin Namno NBCA

This is a small NBCA in the upper Xe Bang Fai catchment on the border to Vietnam, which is linked to the NNT by a narrow gazetted corridor. The biodiversity value is high due to the remote location and the steep terrain. The area is home to numerous distinct ethnic groups. An extension to the south to cover more of the headwaters of Xe Bang Fai has been proposed.

#### Phou Hin Phoun NBCA

This NBCA is also known as the Kammouan Limestone Area. It consists of limestone karst ranges with steep slopes, cliffs and caves. The forests are rather dry and contain habitats for globally and nationally important primates, birds and reptiles. The established corridor with NNT and the planned corridor with NKD will increase the importance and value of Phou Hin Phoun NBCA.

### Phou Xang He NBCA

This area is located south of the Xe Nou, a major tributary to the Xe Bang Fai. It is a hilly area containing many species that are globally threatened. An extension of 117 km<sup>2</sup> to the west and south to incorporate a still largely undisturbed forest area has been proposed.

In spite of the fact that NBCAs have been established, the unique value of the biodiversity in the Bolikhamxay and Khammouane Provinces are under serious threat. In general for the NBCAs in Lao PDR logging and slash and burn cultivation are seen as the most serious threat to biodiversity. In these two provinces, however, and in particular in the western parts, wildlife trade is seen as an even more acute problem (IUCN, 2000). The centre of this trade is supposed to be Lax Xao and about 60-70 % of the goods is assumed to go to Vietnam and eventually to China.

The lower part of the Xe Bangfai plain is highly developed with little natural habitat and wildlife left. A large tract of previously forested land west of Hin Nam No NBCA has been cleared by logging and consequently also lost most of its biodiversity value.

The Wildlife Conservation Society (WCS) is planning a 5-year project in Bolikhamxay Province, co-financed by GEF. Provided that the project plans are approved by GEF and the GoL, this will bring biodiversity conservation in this region an important step forward.

## **10 POVERTY AND ECONOMIC DEVELOPMENT**

### **10.1 Regional Perspective**

During 1985-95, Thailand was one of the fastest growing economies in the world with an average annual rate of growth of over 8 percent. However, the Asian financial crisis that started in 1997 led to an economic slump from which the country now is slowly recovering. While the GDP contracted by minus 10.5% in 1998 the economic growth amounted to an estimated 6.7% in 2003.

Largely escaping the effects of the Asian crises economic growth in Vietnam has been increasing rapidly over the last decade as the country has moved towards a more market-oriented economy. For the period 2000-2003 GDP has grown with around 7% annually. The Vietnamese economy is still expected to grow at a relatively high rate.

While Cambodia experienced a relatively low economic growth during the first half of the 1990s the last years have seen a strong growth of the GDP peaking in 1999 with 10.8% leveling off to an estimated 5.1% in 2003. Continued strong economic growth is expected in the years to come.

Economic development has primarily been concentrated to urban areas and at least part of the urban population has experienced substantial increases in standards of living. The quality of life for poorer people, mainly the rural part of the population, has, however, not changed to a lesser degree. The rural population constitutes more than 80 percent of the total population in the Mekong Basin.