

than double the population by 2010. From there on it may be assumed that the growth will remain high, possibly around 3%.

Gnommalat and the villages along Route 8 up to the regulating dam will experience a considerable population influx and increased urbanization pressure during the implementation of the NT2 Project. Although the 4 planned workers camps with up to 2,200 workers will be located in a forested area at some distance from Gnommalat, one can expect a rise in the population in the villages along the road leading to an amalgamation into a more contiguous urban area. The majority of these will be job seekers, traders and small-scale business people trying to capitalize on the increased economic activity in the area. A conservative guess would be that the inhabitants in the area along the road could reach 2,500-3,000 at the end of the construction period, discounting construction workers. After the construction period an operators village for possibly as many as 150 employees service facilities will be established in the area. Assuming that each employee has a family with 5 household members this will lead to a population increase of 750 after 2010. Afterwards, towards 2025 urbanisation would continue with a growth similar to that of Mahaxai.

*Table 15: Estimated Population Increase in NT2 affected Urban Areas*

Urban area	Estimated Growth Rate		Basis Population	2010	2025
	Up to 2010	2010- 25			
Thakhek	3.5	3.5	33,017 <sup>1</sup>	48,200	80,750
Odomsouk	-	3.0	1,900 <sup>2</sup>	3,500	5,400
Mahaxai	-	3.0	2000 <sup>3</sup>	4,000	6,200
Gnommalath	-	3.0	2000 <sup>3</sup>	4,000	6,200
LakXao <sup>1</sup>	3.0	3.0	12,774 <sup>1</sup>	17,600	27,500

<sup>1</sup> Lao Urban Data Book (2003), <sup>2</sup> Estimate based on SDP/RAP HH figures 2003, <sup>3</sup> Estimated present population

## 6 FORESTRY

### 6.1 Regional Perspective

The remaining forest areas in the lower Mekong is mainly found in Lao PDR and Cambodia. There is however, also some forest left in the Vietnam and Northeast Thailand. The following figures for forest cover have been calculated on the basis of the Mekong River Commission's GIS database.

*Table 16: Forest Cover in the Mekong Basin (MRC 1997)*

Country	Total area (km <sup>2</sup> )	Forest area (km <sup>2</sup> )	Forest cover
Cambodia	181,547	97,748	53.8%
Lao PDR	229,786	88,012	38.3%
Thailand	188,280	29,597	15.7%
Vietnam	67,456	14,127	20.9%
<i>Total</i>	<i>667,069</i>	<i>229,484</i>	<i>34.4%</i>

The MRC figure for Lao PDR diverges from that given in Forestry Strategy for Lao PDR (MAF, 2003) cited below. The discrepancy may be due to different definitions and different ways of measuring remaining forest resources.

During the 1990s, rules and legislation was issued in all countries aimed at effectively regulating and controlling logging and the use of forest resources. Implementation of these regulations has been hampered by weak and resource deficient government institutions and administrations. Thailand totally banned logging of natural forests and Vietnam severely restricted its scale and operation. Cambodia and Lao PDR attempted to manage the sector through concession regulations, but with limited success in terms of gaining control over logging activities.

Cambodia is the country with the highest forest cover of the Mekong basin. However, logging has steadily reduced the forest cover over the last decades and it is steadily declining due to excessive logging operations. The forest cover could thus be considerably reduced, perhaps to somewhere below 50% within a period of 5 years, reaching below 40% in 20 years time.

Having been reduced to just 15-16%, significant further reductions should not be expected in Thailand. In Vietnam increased agricultural activities could reduce the forest cover down towards 15% in the 20-year perspective

## 6.2 Lao Perspective

Lao PDR has over the last decades seen a relatively rapid reduction of its forest cover from 64 % in the mid-sixties to 41.5% today measured as forest with more than 20% canopy density. Although the stated goal is to increase the forest cover substantially there is a danger that it will continue to diminish also in the years ahead. If the decline continues at the same rate as in the last 35-40 years the forest cover could be reduced to 37-38% within in 5 years and down below 30% in 20 years.

A general ban on logging other than for certain concessions - based on a system of forest classification as "Production Forest" or "Protection Forest", has been in place in Lao PDR since 1993. Institutional capacity and a decentralised system of concession granting have however, limited its effectiveness. The provincial authorities are responsible for implementing the system, and since they acquire revenue from forestry (an average of 13.9 percent across the country for 1997) they have an economic interest in maintaining the activity. The issuing of quotas is biased and involves vested interests among various public sector institutions and officials. The result is a forestry management system that is not able to ensure the sustainability of forest resources.

At the policy level, the Lao PDR is encouraging conservation through zoning, protecting forests in steep areas and reforestation. A National Forestry Action Programme involving reforestation of 1.5 million ha of denuded lands has been initiated. Most of the envisaged planting is of fast growing exotics for fuel wood and pulp and paper production.

With regard to the distribution of forest resources across the country the central region is the most endowed. According to figures from 1996 the production forest area there constituted around 52 percent of the country's forest resources (Table 17). Measured in potential production forest volume, the region is even more dominant, accounting for close to 66 percent of total volume on a national basis.

The southern region stands out as the least endowed with only around 9 percent of the total national area.

*Table 17: Regional Forest Area and Biomass in Lao PDR, 1996*

Region	Forest Area		Production Forest		Potential Volume	
	ha	%	ha	%	m <sup>3</sup>	%
Northern	3,902,000	39.7	969,000	39.0	18,773,000	24.1
Central	5,004,000	53.2	1,301,000	52.4	51,202,000	65.7
Southern	2,732,000	61.3	217,000	8.6	7,919,000	10.2
Total	11,638,000	49.1	2,487,000	100.0	77,894,000	100.0

Source: Lao PDR Production Forestry Policy Project, Main Report (figures from MAF)

Considering that the above figures are about eight years old and that comprehensive logging operations have taken place since then, the picture may have changed considerably. The central region has seen extensive logging and may now be more equal with the northern region with regard to remaining production forest resources.

Plans for logging are formulated on a yearly basis by the provinces and submitted to the Ministry of Agriculture and Forestry, Department of Forestry, for consideration and approval. There is allegedly a tendency that the finally approved plans are based more on a negotiations rather than on purely technical criteria and sustainability considerations. In the long time perspective, government policies and regulatory interventions will determine development. In the 'Forestry Strategy to the Year 2020 which presently is under preparation, but not yet adopted, some of the specific objectives addresses the need for future sustainable management and protection of forests:

- Control and eradicate processes that have led to reduction in forest cover and quality whilst improving the livelihoods of the rural to stabilise and increase forest cover and quality
- Bringing wood production from production forest areas under sustainable management in cooperation with local communities, and promote commercial tree plantation by farmers, smallholders, small and medium entrepreneurs and foreign investors
- Ensure protection of water resources and critical infrastructure through forest conservation

### 6.3 Local Perspective

Of the provinces considered in the Lao PDR Production Forestry Policy Project, Savannakhet has the largest tracts of forestland, followed by Bolikhamxay and Kammouan. Kammouan and Bolikhamxay are fairly evenly endowed, differing by only 3,510 ha in forestland area (Table 18).

*Table 18: Forest Land Area in 3 Provinces*

Province	Land Area	Forest Land	
	ha	ha	%
Bolikhamsay	1,486,300	966,095	65
Khammouan	1,631,500	962,585	59
Savannakhet	2,177,400	1,197,570	55

Source: Lao PDR Production Forestry Policy Project, Main Report (figures from MAF, 1995)

It must be assumed that forested land area has decreased considerably as comprehensive logging operations have been going on over the past years. It must be assumed that forestland area has decreased considerably as comprehensive logging operations have been going on over the past years. The following figures (Table 19) give an indication of the scale of timber harvesting that has taken place.

*Table 19: Logging by Provinces 1998-1999*

Province	Logging Volume
	m <sup>3</sup>
Bolikhamsay	38,118
Khammouan	285,481
Savannakhet	99,496

Source: Lao PDR Production Forestry Policy Project, Main Report (figures from MAF)

Khammouan stands out as the province where the most comprehensive and intensive logging has taken place while Bolikhamsay has seen more limited operations in comparison.

It is assumed that the significant cumulative effects of developments in the forestry sector and the NT2 Project will primarily occur in the NT2 Project area itself and in adjacent forested areas such as the NBCAs.

The timber harvesting and logging industry has been one of the major sources of employment in Khammouane Province with around 5000 people engaged in it during its peak in the last half of the 1990s. In 1996 there were 9 privately owned sawmills, 5 joint venture sawmills and 1 kiln-drying facility in the Khammouane and Bolikhamsay Provinces relying on logging in the province. These facilities had a combined intake of around 325,000 m<sup>3</sup> per year. In addition there is a plywood mill (near Mahaxay) and a chipboard factory in Khammouane with a combined intake of 100,000 m<sup>3</sup> per year.

There are 2 designated production forest areas in Khammouane Province, each of around 60,000 ha. These are the Dong Khaphat-Nakating area located in the southeast between the Khammouane-Savannakhet border and the Xe Bangfai, and the Dong Phou Soi-Khamchouan located in the southwest between Route 13, the Savannakhet border and the Mahaxay-Xaibouathong road

It has been estimated that from 2005 the annual supply from these lowland production areas will be about 100,000 per year (IUCN, 2000b). The timber and

wood supply in Khamouan will thus be seriously deficit in relation to the current capacity of the wood processing industry. In fact, diminished wood supply has already led to a contraction in the industry and number of people employed in it.

In Boulikhamsay 8 sawmills and timber processing mills were operating in the province around year 2000 with a combined processing capacity of around 100,000 m<sup>3</sup> per year. In addition, a large integrated wood-processing plant has been constructed at Lak Xao. The production capacity of this plant is assumed to be around 250,000 – 300,000 m<sup>3</sup> per year

Today there is only one production forest area in Boulykhamaysay Province with a potential yield that is far less than the current installed production capacity of the processing industry.

An initiative to improve sustainability in the forestry sector is the SUFORD project currently being implemented in Khammouane, Savannakhet, Salavan and Champassak. provinces. The project will work in 3 districts in Khammouane. Two of these, Mahaxai and Xe Bangfai, are located in also the NT2 impact zone. The 2 production forest areas form part of the project area. Project components include capacity building and sustainable forest management with demonstrations of management practices in the field including active participation of villagers. The field implementation will cover 528,000 ha of natural forest whereof 110,000 are in Khammouane Province. The implementation period started in 2003 and will continue up till 2007.

Another potentially important factor that will influence the forestry sector in the future is the development of tree plantations with fast growing species suitable for industrial use. The BGA Company is presently developing a total area of 154,000 ha in Boulikhamsay Province. One third will be planted to mainly *Eucalyptus camadulensis*. The plantation area is divided in several sub-plots situated between the Mekong and the mountain range from Pakkading in the north to the mouth of the Hinboun River in the south.

Finally, according recent initiatives from biggest rubber company, Thai Rubber Latex Corporation, Boulikhamsay is one of the 2 provinces that are considered for establishment of sizable rubber plantations. The company has already made some surveys of potential sites. If the investment goes ahead the company will establish around 14,000 ha (100,000 rai) of plantations in the country.

## 7 INDUSTRY

### 7.1 Regional Perspective

The most industrialised countries in the region are Vietnam and Thailand. However, in these countries most of the industrial activities take place outside the Mekong Basin. Cambodia and Lao PDR have only a modest industrial sector. In Thailand's part of the Basin, the main industry is food processing. Nakhorn Ratchasima is the main industrial centre of the Northeast.

In Lao PDR and Cambodia, industrial development is at an early stage, but the sector is rapidly expanding as especially the textile industry is growing fast. In both countries industrial development is concentrated in the capitals.