

Apart from Theun Hinboun Extension there is no hydropower development expected before 2025 that might influence the hydrology of Xe Bangfai and Nam Theun – Nam Kading. Although presently being studied by a potential Developer Nam Theun 1 is not considered to be a realistic and viable alternative.

3 TRANSPORT

3.1 Regional Perspective

The 1997 MRC Diagnostic Study describes status and development trends for roads, railways, inland waterways, and air transport. The conclusions are summarized in the following.

Except for the Mekong Delta and the Tonle Sap area where water transport is predominant, roads are the main arteries of transport. The standard and density of the roads are, however, in many places inadequate. Cross border road links are few, and the ones that are of a decent standard (road linking Phnom Penh with Ho Chi Minh City and the one linking Nong Khai with Vientiane) are very important to regional trade.

Within the Lower Mekong, waterways transport is important both for small-scale transport in tributaries and channels and for heavy-duty transport. Phnom Penh can be reached by vessels up to 2,000-3,000 DWT via either the Mekong or the Bassac. The Mekong stretch between the Yunnan border and Savannakhet (Lao PDR) serves as a navigable waterway. The size of vessels is, however, restricted and dependent on the season, because of several stretches of obstacles and lack of markings.

Railway transportation plays a modest role in the region. The railway system is best developed in Thailand, and also found in Vietnam and Cambodia. Lao PDR presently has no railway.

ADB has initiated plans for development of the regional road network as part of their Greater Mekong Co-operation initiative. The priority road corridors are:

- R1: Bangkok - Phnom Penh - Ho Chi Minh City - Vung Tao, which is nearly finished.
- R2: The Thailand – Lao PDR - Vietnam (East-West Corridor), which is also close to completion
- R3: Chiang Rai – Kunming (Northern Corridor), where construction is about to start.

Potential for upgrading of waterways has been identified by MRCS along the Lao PDR-Myanmar border and between Vientiane and Savannakhet. The upgrading might include some hydraulic works for improving the navigable channel. The reach around the Khone Falls (near the Lao PDR-Cambodia border) is not passable and blocks the continuity of the waterway. Establishing the required system of channels, locks and sluices for negotiating this reach is not considered economically feasible.

The MRC Strategy on navigation is however, not specific about larger dredging and hydraulic works along the Mekong. Its focus is on the removal of the non-physical obstacles to navigation and on improving the safety and possibility for

low flow and night-time navigation by better marking and other navigation measures.

Plans exist for a rail link between Nong Khai (Thailand) and Vientiane; between Thailand and Yunnan; and one for connecting Thailand, Cambodia and Vietnam. The Nong Khai–Vientiane connection now seems to be proceeding with Thai and French funding.

The development of transport links will have a major impact on the development of the region. This includes: new opportunities for economic development, new urbanisation patterns, new location preferences for industries, better access to markets for agriculture and fish products, new opportunities for tourism, etc. However, it might also induce negative impacts like increased pressure on natural resources and biodiversity, human trafficking, spread of HIV/AIDS, threats to the lifestyle of ethnic minorities, etc. There might be both local and cross-border effects.

3.2 Lao Perspective

In the context of poverty reduction and social and economic development, transportation is regarded as a key factor. Today a major share of government funds is channelled into the transport sector while it receives around a quarter of the total overseas development assistance. Particular emphasis has been put on improving road links between the major towns in Lao PDR. Paved roads, in largely good condition, now connect Vientiane with Savannakhet and Pakse to the south and Luang Prabang to the north. Still, in spite of these improvements the transport sector, and in particular the road sector, remains largely underdeveloped in terms of good all-weather rural roads. Insufficient resources to maintain roads once they have been constructed or upgraded add to the problem of poor road standards throughout the country.

The entire road network in the country includes a little more than 7,000 km of national roads, around 9,000 km of provincial roads and roughly 6,600 km of district roads. Another 9,900 km is classified as community/access roads. In terms of length only a little more than half of the national roads were paved in 2002 while the percentage for provincial and district/community roads were less than three percent. Gravel and earth roads account for the remainder of the road network.

The Ministry of Communication, Transport, Post and Construction (MCTPC) is responsible for planning and management of the road network but is increasingly delegating responsibilities to the provincial departments (DCTPC).

Compared to its neighbours Lao PDR has a low road density per square km. The usage of the roads are still considered as light with average daily traffic (ADT) for national roads varying between 250 and 500 vehicles and less than 50 on secondary roads. However, traffic on Route 13 is substantially higher being the main north-south trunk road in the country. A traffic survey carried out by MCTPC in 2000, recorded ADTs from around 700 to 1000 on different sections north and south of Thakhek.

Registered vehicles in the country amount to around 38,000– 39,000 cars and pickups, 14,000 heavy trucks and buses and some 168,000 motorcycles. By far the highest concentration of registered vehicles is found in and around Vientiane. Annually the number of registered vehicles increases with around 17 percent.

The Government regards improvement of the road system as a key to improved national and regional integration and thereby economic growth and poverty reduction. After rehabilitation of the main arterial roads the next priority will be to strengthen the connections between provincial and district centres. This will help bring the benefits of the arterial road network improvements to rural population that presently have no road access.

The Governments 15-year strategy for the road sector includes the following measures:

- institutional capacity to plan and manage the road sector
- prioritizing of the all-weather road network maintenance and replacement of donor funding with domestic funding
- road-use regulations to prevent deterioration of road conditions from overweight vehicles
- safeguarding of environmental and social impacts through environmental mitigation measures and proper resettlement and compensation
- implementation of road safety measures and establishment of a high level National Road safety Council
- increasing private sector participation and strengthening of the domestic contracting industry
- community participation in planning construction and maintenance of district and rural roads.

The high level of investments in the transportation sector is foreseen to continue in the years to come. From 1996 to 2000 56% was allocated to the transport sector, equivalent to about 7% of the GDP. The present relative imbalance between capital and recurrent expenditures for maintenance is also expected to continue. Presently the capital investments spent for upgrading or construction of roads constitutes around 85% of the transportation budget.

3.3 Local Perspective

Branching off from Route 13 roads running east-west traverse and encircle the NT2 Project area. These roads will constitute factors that influence and drive social and economical developments in the NT2 Project area and beyond, adding to those created by NT2 . Road improvement projects are in the process of being implemented or have been planned for the most important of these roads.

In Savannakhet the ADB supported East-West Corridor Project (Route 9) is nearing completion. The 2000 traffic survey recorded ADT figures around 700 on the section near the border to Vietnam. The improvement will substantially increase the movement of goods and people through the province. However, Route 9 is located some 100-130 km south of the NT2 Project influence area and will as such only have a peripheral effect on developments there.

The East-West Corridor Project also includes the construction of a bridge connection between Mukdahan on the Thai side of the Mekong and Savannakhet on the Lao side. The bridge is planned to be completed by 2006, that is, during the early construction phase of the NT2 Project. In relation to cumulative effects the bridge will probably be more significant than the improvement of Route 9 as it will create a conduit for cross border trade and transport that is likely to influence economic development in the NT2 Project influence area.

In Khammouane, Route 12 from Mahaxai to the Vietnamese border is being upgraded, financed by GoL. It is due to be finished in November 2004. The section between Gnommalat and the Vietnamese border has an ADT of around 300 according to the 2000 MCTPC traffic survey. Between Gnommalat and Thakek the traffic was found to be lighter with an ADT of around 100.

The upgrading of the provincial road from Mahaxai to Boualapha District (46 km) is just finished with support from SIDA. It is expected that SIDA will continue its support for community and district roads in Khammouane.

According to information obtained at the district level a new road from Gnommalath into the Phu Hin Poun NBCA is being constructed as a part of an initiative to develop ecotourism in the area. Information on the exact location of this road was not obtained.

Route 8B starting at the junction with Route 12 and traversing the NT2 Project area and the Nakai Plateau was recorded to have a considerable traffic load with an ADT of more than 300 in 2000. As the ADT figures for Route 12 indicates most of this traffic probably went to Vietnam.

In Bolikhamxai, the most important road in the NT2 context is Route 8 that runs from Vieng Kham on Route 13 through the important district town of Lak Xao and on to the Lao-Vietnamese border. The road will be surfaced for all its length. According to plans the upgrading will be finished towards the end of 2005. As a part of the feasibility study for the upgrading of the road a traffic survey was carried out in 1998. The traffic was counted at 3 stations, one located at Viengkham village, close to Road No. 13, one at the bridge across the Nam Theun at Ban Tha Heua, and one Ban Phon Men between Lak Xao and the Vietnamese border. The recorded ADTs were 169 at Viengkham, 181 at Ban Tha heua and 193 at Ban Phon Men.

The NT2 project will improve and realign Road No. 8b that runs from the junction on Road 12, through Gnommalat and across the Nakai Plateau to the Nakai dam site. On the section of between the dam site and the junction with Route 8 north of Lao Xao some improvements are likely to be made by the NT2 Project but it is not known to which standard it will be rehabilitated.

Little is known of transport initiatives in long-term perspective. It is expected, however, that this area will provide more and more important corridors for transport of goods and people between Thailand, Lao PDR and Vietnam. This will lead to development of infrastructure and service facilities related to transport in the three provinces and in the districts on the Thai and Vietnamese side of the border.

Concerning air traffic the Integrated Regional Development Plan for the Savannakhet and Khammouan Region (JICA/CPC 2001) proposes to extend the runway and upgrade Savannakhet Airport to international status, as tourism and economic activity in connection with the special economic zone should create a higher demand for air travel. It also proposes that passengers from Mukdahan in the future should utilize the airport and fly to Bangkok from Savannakhet by establishing a special in-migration control arrangement. If this proposal is pursued, it is unlikely that it will be realised until some time after 2010. The annual passenger demand for the Savannakhet-Bangkok route is forecasted to be around 39,000 in 2012 and 63,000 in 2017

Thakhek is among the alternative locations for a future Mekong bridge after the construction of the second friendship bridge at Savannakhet is finished in 2006. The Thai authorities have already indicated interest in a Nakhon Phanom-Thakhek bridge, and it is likely that it will be realised within the time period 2010-2020.

4 WATER SUPPLY AND SANITATION

4.1 Regional Perspective

Reported per capita use and demand of water for domestic purposes varies between the countries and between different studies. Demand studies have used assumptions of up to 100 m³ per capita per year, which sounds very high in countries where a large part of the population lives in rural areas with underdeveloped infrastructure. Also the population growth figures for the individual countries vary, which also results in different scenarios for future water demand.

Table 8 shows estimated population and domestic water demand in the Lower Mekong Basin by 2025. The table is based on figures from documents produced for the MRC Basin Development Plan and Water Utilization Programme.

Population growth rates in the Lower Mekong Basin are expected to decline in the future, mainly because of general economic growth and family planning.

Table 8: Population Increase and Water Consumption

Country	Population 2000	Growth rate %	Population 2025	Demand per capita m ³ /year	Total demand 2025 mill m ³
Cambodia	9,800,000	2.3	17,303,000	12	208
Lao PDR	4,905,000	2.6	9,318,000	20	186
Thailand	23,130,000	1.0	29,663,000	24	712
Vietnam	16,920,000	1.4	23,952,000	42	1,006
Total	54,744,000		80,235,000		2,112

Source population figures: MRC-BDP Regional Sector Overview 2002

Source water demand estimates: MRC Water Utilization Programme, 2002

The estimates show that the population may reach 80 million people by 2025 corresponding to a water demand of around 2,100 million m³. This translates to an average loss of flow of about 70 m³/s in the Mekong Delta. The need for more water can be counteracted to some extent by improvements in efficiency of supply and leakage reduction in the distribution network. Appropriate pricing of water is also an important countermeasure against excessive use and wastage. Water demands reported per capita use and demand of water for domestic purposes varies between the countries and between different studies.

In Cambodia and Lao PDR, the major cities and towns are close to the Mekong and the main obstacle to supply capacity is lack of treatment plants and distribution network. In Thailand and Vietnam some urban areas rely on groundwater and the demand may be higher than available resources. Supply in the dry season is already a problem.