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Multiple use benefits

Nam Ngum 1 Hydropower Plant, Lao PDR

Originally proposed for its power generation benefits to Lao PDR, the Nam Ngum 1 Dam creates significant additional benefits, including flood protection and a number of new industries that have radically boosted the local economy.

Overview

During the 1960s, power production in Lao PDR was insufficient to meet the national demand. The Mekong Commission as part of a national development plan constructed Nam Ngum 1, the first hydropower scheme in Lao PDR. Feasibility studies presented in 1962 indicated that the dam would not only aid in meeting electricity demand, but would also provide flood mitigation and irrigation benefits.

Nam Ngum Dam is situated 60 kilometers north of Vientiane on the Nam Ngum tributary of the Mekong River. It is a concrete gravity dam with a power station at the base and penstocks within the dam wall. The powerhouse originally contained two 15 MW generators, to which two 40 MW generators were added in 1978 and a third 40 MW generator in 1984

Dam Name

Scheme operator
Electricité du Laos

Size of scheme (MW)
150

Country
Lao PDR

Catchment area
8460 km^2

River
Nam Ngum River

Effective reservoir capacity
4700 x $10^6 m^3$

Construction years
1968-1971

Reservoir size
400 km^2

Details

Though this project was originally implemented as a stand-alone hydropower project, the dam and reservoir provide a great deal of ancillary benefits to local communities, including:

- *Flood management*
  Current operating rules for the storage are designed to protect downstream populations and agricultural crops. The rules include a requirement to draw down the water level prior to commencement of the wet season, providing a 1 billion cubic metre flood retention capacity.

- *Creation of a commercial fishery*
  The importance of a newly created fishery was an unanticipated outcome of the Nam Ngum 1 project. Fishery development projects contributed by Netherlands and Switzerland included construction of primary schools and water supply networks, the provision of monofil gill nets and boat engines to selected villages. The Nam Ngum Reservoir Management and Development Organization (NMDO) manage the lake fishery. According to this organization, the annual production of economically important species is about 6,000 tons. The fishery has created jobs and significant growth in the economy of the region. Of the approximately 16000 people living around the shoreline of Nam Ngum Lake, it is estimated that over 92% are engaged in commercial fishing activities.

- *Irrigated agriculture*
  The creation of the Nam Ngum Power Station enabled the use of electric pumps, making lift irrigation a viable option. This created more than 13,000 ha of new dry season agriculture, and in 1998 approximately 25% of the country's rice production came from areas that were cultivated by means of lift irrigation.

- *Tourism*
  More recently, tourist developments have to appeared at Nam Ngum, including the Dan Sa Vanh - Nam Ngum resort, boasting a hotel, restaurant, golf course and gaming room. 21,000 tourists visited the resort in 2002, 70% of them foreigners, contributing USD$630,000 to the local economy. The resort is expected to expand its operations, and it is projected that this will result in a USD$5 million boost to the local economy annually.

Other Aspects

Demonstrated need
Lao is one of the world's poorest and least developed countries, with annual per capita income in 1994 estimated at US$295-335. There is very little industry, with agriculture and fishing the most common commercial activities. Lao PDR's hydropower potential is one of the key resources of the country. The country has an estimated generation potential of some 18,000 MW from over 60 project sites on tributaries of the Mekong River, of which less than 3 per cent have been developed.

The ability to sell electricity to Taiwan has significant implications for the Laotian economy.

Further Information

Source: Hydropower Good Practices Workshop, Annex VIII - Examples for Good Practice Report, Villach, Austria, October 2005. International Energy Agency.

http://www.poweringprogress.org/lao-energy/policies/pss5.htm

http://www.small-hydro.com/index.cfm?Fuseaction=countries.country&Country_ID=91