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The Environmental and Economic Impacts of the Nam Theun 2 Hydroelectric Project on Communities Living in the Xe Bang Fai River Basin

16 March 2004

If built, the Nam Theun 2 Hydroelectric Project in Lao PDR would:

- completely change the flow of the Xe Bang Fai River;
- cause severe impacts on the abundant fisheries and other resources that are fundamental to the food security of hundreds of communities;
- cause severe impacts on the livelihoods, food security and economy of between 50,000 to 120,000 people living in the Xe Bang Fai River Basin.

The main environmental and social impacts of the Nam Theun 2 Hydroelectric Project will be on the Xe Bang Fai River in central Lao PDR, a major tributary of the Mekong River. Approximately 50,000 people live in communities located along the Xe Bang Fai River. Another 50,000 to 70,000 people are estimated to live along tributaries of the river, or in the vicinity of these rivers. These people depend on the Xe Bang Fai River's fisheries and other livelihood resources (other aquatic animals, wetlands, wild plants, riverbank gardens, floodplain agriculture, etc.) for their food and livelihood security.

If built, the Nam Theun 2 project would divert 95 per cent of the flow of the Nam Theun River through the project's powerhouse and release this water into the Xe Bang Fai River Basin. These releases of up to 330 cubic metres per second (m^3/s) would completely change the natural, seasonal flow regime and aquatic habitat of the Xe Bang Fai River. Water discharged by the Nam Theun 2 project would effectively double the annual flow volume of the Xe Bang Fai (as measured at the district town of Mahaxai) – from 7,745 million cubic metres (MCM) to 14,745 MCM per year, and increase water levels in the Xe Bang Fai by up to 4.5 metres.

According to the International Environmental and Social Panel of Experts for the Nam Theun 2 project, "The PoE is of the opinion that one of the Nam Theun 2 project's most serious impacts on livelihood can be expected in the densely populated (over 50,000 people) Xe Bang Fai basin where greatly increased river flows from the powerhouse can be expected to alter fish behavior, fishing technology, and access to river bank gardens." (p.30)

The Panel of Experts makes the mistake of considering only people living in the vicinity of the Xe Bang Fai River to be dependent on the river. A much more accurate picture of the situation is provided by a report entitled *The People and Their River*, published in late 2001,

“According to statistics from district offices, recent research, and the study team’s interviews with villagers, an estimated 120,000 to 130,000 people are currently deriving significant and important livelihood benefits from the Xe Bang Fai River. This population includes approximately 50,000 people living in at least 125 villages located directly adjacent or very close to the Banks of the mainstream Xe Bang Fai from its headwaters and its confluence with the Mekong River. Many other villages are located along the eight main tributaries of the Xe Bang Fai and smaller permanently flowing and seasonally flowing tributary streams within the basin. The study team was able to estimate that 20,000 people live in villages along four of the major tributaries. There are villages located along other major tributaries but these populations could not be reliably estimated.

“People from communities located at distances up to 20 kilometres from the Xe Bang Fai travel to the river to fish on a seasonal basis. Some keep their own boats along the river near the houses of relatives, and have fruit orchards and cultivate vegetable gardens near the river. According to local people living in riverside villages, people from many villages located far from the Xe Bang Fai come to the river to fish, collect other wildlife and plants, or to garden. Many communities living even further away from the river have important trading relationships with communities along the Xe Bang Fai.” (p.XI)

According to the *Xe Bang Fai Socio-Economic Health and Fisheries Survey, 2001 Basin* by agencies of the Government of Lao PDR,

“The importance of wild fish capture to households in all zones is greater than their financial value suggests. Fish appear to provide the major source of animal protein to these communities...Any significant change in fish stocks would likely have a substantial impact on the food consumption patterns and perhaps nutritional status of most households across all zones. Data suggests that this impact would be greatest amongst the poor.” (p.3-13)

While providing an accurate picture of the livelihoods and economies of the people of the Xe Bang Fai River Basin, the Survey’s data is gathered from only one-third (approximately 49,000 people) of the population of the basin. As noted by the *The People and Their River* report, the number of people for which a “significant change in fish stocks would likely have a substantial impact” could be significantly greater than the estimate provided by project proponents like the Nam Theun 2 Panel of Experts. However, at present the number of people and families that would suffer the impacts of the Nam Theun 2 project on the Xe Bang Fai is not known. It is the responsibility of the Nam Theun 2 Power Company (NTPC, the consortium proposing to build the project) to undertake studies that would provide an accurate assessment of how many people will be affected by the impacts of the Nam Theun 2 project.

Excessive Flooding

The middle and lower areas of the Xe Bang Fai basin are areas with very productive rainy season rice crops, but are also susceptible to flooding that can damage the rice crop. According to the *Socio-Economic Health and Fisheries Survey*, in 53 villages with a combined population of 29,438 people (49.8% of total lower Xe Bang Fai population), and 12 villages with a population of 3,866 people (10.3% of middle Xe Bang Fai population), 86-95% of the surveyed households cultivated lowland paddy fields. People have adapted their rice cultivation and livelihoods to the natural floods of the Xe Bang Fai. Some years, the rice harvest provides a two-year supply of rice for families. Other years, much of the crop is damaged by excessive flooding.

In the middle and lower Xe Bang Fai basin, project proponents claim that, regarding Nam Theun 2 discharges into the Xe Bang Fai, “The net result for the zone is likely to be little change in the **flood levels**” but offer no substantive evidence to support this claim.

More importantly, project proponents do not assess the inevitable **increase in the duration of harmful floods** in the middle and lower Xe Bang Fai basin as a result of the Nam Theun 2 discharges. According to NTEC’s Concession Agreement with the Government of Laos, Nam Theun 2 can discharge water into the Xe Bang Fai until the combined natural volume and the Nam Theun 2 discharge equals 2,270 m³/s at the district town of Mahaxai in the upper basin. Thus, for example, if the natural flow of the Xe Bang Fai were 1,800 m³/s, Nam Theun 2 could discharge an additional 300 m³/s – an additional 1,000,000 cubic metres per hour – for a total flow at Mahaxai of 2,100 m³/s. This flow exceeds the mean annual peak flow at Mahaxai over the 15-year period between 1988 and 2002 (Mean Peak = 2,053 m³/s, Environmental Assessment and Management Plan, p. 6-27).

Thus, over a period of days or weeks during the rainy season, the Nam Theun 2 discharges would increase water volumes in the middle and lower Xe Bang Fai River, and thereby increase the duration of flooding. Such an increase could have severe impacts on the productivity of the rainy season rice crop of thousands of families living in the middle and lower Xe Bang Fai basin.

As reported in the *The People and Their River* report,

“All of the villages situated along the lower and middle sections of the Xe Bang Fai River do at least some lowland [rainy season] rice farming (*het na*), and people in many villages identify lowland rice cultivation as their most important livelihood activity.

“The success or failure of rainy season rice farming is closely related to the natural floods of the Xe Bang Fai River.

“Planting rice is a yearly gamble in which farmers invest in seeds, labour and other inputs in the hope that the floods will not be severe. According to villagers there are very tight flooding margins involved in growing rice in the rainy season, and relatively small increases in the depth and/or duration above the optimal flood can

make the difference between having a large harvest of rice or no harvest at all.”
(pp.38-39)

Project proponents and the EAMP for Nam Theun 2 have not studied (and, indeed, have dismissed) the potential impacts of extended flooding on rainy season rice cultivation in the middle and lower Xe Bang Fai basin. These impacts would negatively affect the production of rice, the staple food for tens of thousands of people in the middle and lower Xe Bang Fai River Basin. Again, it is the responsibility of the Nam Theun 2 Power Company and other project proponents to undertake studies that would provide an accurate assessment of how many people will be affected by the impacts of the Nam Theun 2 project.

The False Promise of Mitigation

Project proponents have suggested that dry season pump-based irrigation of rice and other crops would mitigate the impacts described above. There are at least four reasons to question the practicality of such proposals.

- Recent experience with dry-season irrigation indicates that porous soils, pests, the high-price of electricity and diesel fuel to power the pumps, and poor economic returns of dry-season rice cultivation have convinced many people to abandon dry-season irrigation along the Xe Bang Fai River.
- Proponents of dry-season irrigation suggest that as Nam Theun 2 outflow will substantially increase water levels in the Xe Bang Fai River, the use of irrigation pumps will be more economical. Even if dry season irrigation projects are successful, only those families living along the Xe Bang Fai River would be able to use the increased flow volumes discharged by Nam Theun 2. Thousands of families living further away from the Xe Bang Fai, or along its tributaries, would not receive dry-season irrigation.
- The riverbanks of the Xe Bang Fai are already the location of highly productive vegetable and cash crop gardens that would be permanently flooded by the Nam Theun 2 discharges. Even if dry season irrigation projects are successful, these crops would only be replacing (and possibly slightly increasing) existing riverbank crop production. Dry season irrigated crops will require the purchase of expensive fertilisers and chemical pesticides which are seldom used on the fertile riverbank gardens. Overall, there will be little, if any, gains in productivity or income for affected families.
- Severe damage to the habitat of the Xe Bang Fai River would substantially reduce populations of fish and other aquatic animals that are the most important – and freely available – source of dietary protein for families in this river basin. Even if dry season irrigation projects are successful, rice and other crops will not be a substitute of the protein and nutrition presently gained by local people from their consumption of fish and other aquatic animals.

The severe damage, and possible destruction, of the fisheries of the Xe Bang Fai, and other livelihood resources such as dry season riverbank gardens, by the Nam Theun 2 Hydroelectric Project would cause irreversible long-term impacts on the livelihoods and economies of tens of thousands of people living in the Xe Bang Fai River Basin. The water discharged by the Nam Theun 2 project into the Xe Bang Fai will increase the duration and severity of flooding in the middle and lower Xe Bang Fai basin, negatively impacting the rainy season cultivation of rice of thousands of families.

Project proponents consistently claim that the Nam Theun 2 Hydroelectric Project is a “multi-purpose development project” that would “conserve the environment and alleviate poverty” in Lao PDR. Although the number of people who would suffer the environmental, social and economic impacts of this project can only be estimated, it is evident that the Nam Theun 2 project would cause the impoverishment and immiseration of tens of thousands of people living in the Xe Bang Fai River Basin.

References:

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