

**PROPOSED NAM THEUN 2 HYDROELECTRIC PROJECT in LAO PDR
COMMENTS on WORLD BANK RESPONSES to INDEPENDENT TECHNICAL
REVIEWS**

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March 28, 2005

In March 2005, the World Bank issued a response to the independent technical reviews of Nam Theun 2 (NT2) project documents, commissioned by International Rivers Network and Environmental Defense. In its response, the World Bank only addressed the main summary points of the technical reviews and did not consider the main report, which elaborated and further justified these points. By considering the summary in isolation, the Bank failed to address several important concerns, which should now be reemphasized. Below is a response to the Bank's evaluation of the technical review summary on water quality (numbers refer to corresponding pages and paragraphs in the Proposed Hydroelectric Project in Lao PDR, World Bank Responses to IRN-EDF Technical Reviews, March 21, 2005).

Page 5 – items 6 and 7:

The important technical point with regard to the data used to characterize the baseline water quality of aquatic ecosystems in the EAMP is **not** how data availability might compare to what “one might see in a developed country context.” Rather, the point is that from a scientific standpoint, it is not acceptable to calibrate and use water quality models based on inadequate datasets in any context. Nam Theun 2 is a major project that will result in serious ecological damage both in the project area and beyond in the Mekong River ecosystem. Most of the ecological damage, including serious water quality degradation, cannot be effectively mitigated or compensated using the vague methods outlined in the EAMP.

- Contrary to the Overview statement on page 1, the fact is that the data and publications describing the modeling used to predict the baseline water quality **were not available** for technical review.
- The statement that “prevention through reduction of biomass in the reservoir area” will mitigate anoxia and other forms of water quality degradation is misleading given the absence of a clear and comprehensive biomass removal protocol in the EAMP.
- Some mitigation of water quality degradation may be possible using outlets in the dam and power station and downstream aeration devices. However, given the unreliability and maintenance problems associated with using both approaches, the

mitigation will most likely be incomplete and inadequate to support a healthy reservoir and river ecosystem.

- Many of the negative ecological effects of water quality degradation that will result from Nam Theun 2 will be irreversible and therefore *cannot* be corrected by “monitoring and adaptive management” and/or “mitigation programs.”
- Severe anoxia will produce toxicity to fish, macroinvertebrates and other organisms following deep water sediment releases of toxic heavy metals and metalloids (e.g. lead, copper, cadmium, zinc, arsenic), toxic organic compounds, and hydrogen sulfide and methane.
- None of the toxic releases from Nam Theun 2 sediments “will be limited to the deepest parts of the reservoir,” but will rather be **transported horizontally and vertically throughout the reservoir water column and downstream.**

Page 5 and 6 – item 8:

The EAMP claims that their “water quality model estimated the growth of algae, cyanobacteria, and diatoms.” But the models were apparently calibrated using the same inadequate data sets, and methods *not available for technical review*.

- The EAMP *has not* “sufficiently analyzed and assessed the impacts of cyanobacteria, algae, and related species.” It merely states that “In subsequent years, high stocks of cyanobacteria are expected to occur under low nitrogen conditions, at the end of the dry season.”
- The report ignores the important ecological details that can help to explain the primary causes of **toxic blooms of cyanobacteria and algae rather than simply estimating “stocks of cyanobacteria.”** The behavior of different cyanobacterial species in phytoplankton communities is not homogeneous due to their different ecophysiological properties. The implication throughout the EAMP that nutrients are the only important factor influencing cyanobacterial communities is a major flaw in the analysis.
- The plans to encourage a “salvage logging program - - - to reduce nutrient-rich biomass in the reservoir” along with the control of “nutrient pollution due to human activities around the reservoir” are particularly vague and unconvincing from a technical standpoint.
- The statement that “water supply for domestic use in the resettlement area will largely be independent of the reservoir” lacks any detail or plan to effectively accomplish that objective. In addition, nothing is stated about how the use of reservoir water by people outside of the resettlement area will be managed.
- The statement that “water quality will be monitored to detect if cyanobacteria toxins become established; and - - - measures will be taken to avoid direct exposure by livestock and humans” is simplistic from a technical standpoint. It is well recognized by experts that “Cyanobacterial blooms and cyanotoxins present a special challenge to monitoring programmes because the requirements are different from well-recognized monitoring designs both for pathogenic bacteria and for toxic chemicals” (1)

- (1) Chorus, I., and J. Bartram (eds.) 1999. Toxic Cyanobacteria in Water – A Guide to Their Public Health Consequences, Monitoring, and Management. E & FN Spon, London, 416 pp.

Pages 6 and 7 – items 9 and 10”

- The statement that “The importance of macro-invertebrates to the nutrition of the local populace and as feed for fishes is clearly recognized in the EAMP and SDP” exemplifies the extremely shallow level of analyses that characterizes the EAMP. Macroinvertebrates contribute far more than just food for higher organisms, including valuable ecosystem services that maintain good water quality, and regulate the detritus cycles that provide the main source of energy to rivers and help to regulate the nutrient ratios that sustain a balanced system.
- The EAMP **lacks data on the species of macroinvertebrates** in the Nam Theun, Xe Bang Fai, Nam Kading, Nam Kathang, and Nam Phit rivers.
- The SDP **does not** present “a comprehensive health program” as claimed. The assessment merely discusses the major categories of water-related and vector-borne disease, and then provides a series of vague, simplistic descriptions of how the problem areas will be mitigated.
- It is not accurate to state that “Increased availability of water in this area due to the project is unlikely to change” liver fluke incidence. Increased snail habitat from project construction is likely to increase the transmission of liver fluke disease.

The vector of the Mekong Schistosome (*Neotricula aperta*) is found in the project area. The construction of Nam Theun 2 will increase the optimal habitat for *N. aperta*.

- It is not known if *N. aperta* populations in the project area harbor the Mekong Schistosome. The potential changes in demographics both for snail and human populations resulting from Nam Theun 2 may establish the disease in the area.
- As noted in the EAMP/SDP, “Water changes in the lower Xe Bang Fai may increase the prevalence of Dengue, which is highly prevalent in the flooding season. Prevention, awareness, and treatment programs will be implemented.” No details are provided on how Dengue increases will be effectively mitigated given that no prophylactic medicine is available for the virus.