

RESPONSE TO WORLD BANK'S REVIEW OF NAM THEUN 2 INDEPENDENT TECHNICAL REVIEWS

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Downstream Fisheries Impacts on the Xe Bang Fai and Compensation for Downstream Communities

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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 summaries on downstream fisheries impacts on the Xe Bang Fai (XBF) and compensation for downstream communities (numbers refer to corresponding paragraphs in the Proposed Hydroelectric Project in Lao PDR, World Bank Responses to IRN-EDF Technical Reviews, March 21, 2005).

Downstream Fisheries Impacts on the XBF River

11. The Bank and NTPC environmental experts do not deny that a “collapse in the aquatic food chain” in the XBF river is a highly likely scenario, and correctly identify some of the main causes of this phenomenon. However, they fail to mention additional factors that could help fuel the collapse, including the significantly cooler water entering the Downstream Channel from the Nakai Reservoir and the risk of foul water conditions occurring downstream due to a combination of low oxygen, high biological oxygen demand (BOD), and elevated levels of methane, hydrogen sulphide and ammonia. Taken together, these factors could be lethal to aquatic life for many miles below the Nam Phit confluence, possibly right down to the Mekong in a worst-case scenario.

According to the Nam Theun 2 Social Development Plan (SDP), “[d]ischarges from NT2 powerhouse will be cooler than the receiving waters from Xe Bang Fai, probably between 3 and 5 °C during the rainy season and 3 °C during the dry season” (Vol. 3, Chapter 31, p. 18). The proposed mitigation measures will do little to lift the water temperatures. Furthermore, some studies suggest that even temperature differences as low as 2 to 3 °C are enough to be lethal to fish in the Nam Theun basin (Schouten et al., 2004). An injection of such cold water from the Nakai Reservoir is regarded by Dr Tyson Roberts (1996) as, “the most serious impact from Nam Theun 2 on the Xe Bang Fai” and he could not foresee there being an effective mitigation method to ameliorate the impacts. Hence, far from “an estimated 24 % decline in finfish, mollusk, shrimp and aquatic plant production” being a “worst case scenario”, the Bank should reconsider this optimistic appraisal to prepare itself for compensating far greater losses than presently anticipated, especially in the hardest hit areas closest to the discharges.

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Furthermore, the Bank's response includes inaccuracies regarding the Theun Hinboun Hydropower Project (THHP), which they use in an attempt to show the mitigation measures being undertaken for NT2 are superior to those incorporated in past projects. While the Bank's response states that "the THHP lacks a downstream regulating pond and aeration weir that are features of the NT2 project," in reality THHP has a 520,000 m³ re-regulation pond, and it lacks an aeration weir simply because deoxygenated water is a temporary seasonal problem at THHP, unlike at NT2. Despite the regulating pond, THHP has a daily maximum water level fluctuation of 2 m in the downstream Nam Hai and Nam Hinboun rivers.

The Bank's response acknowledges that "[i]n the upper Xe Bang Fai, the water level will increase 4-6 metres over ambient minimum levels in the dry season", clearly illustrating the far greater hydrological impact of NT2 on the recipient river than in THHP. Flow volumes in the dry season will be up to three times more than that at THHP, and the presently rich Nam Phit recipient river will effectively be destroyed, unlike the Nam Hai which still supports a fishery, albeit at a reduced level. Thus it is misleading to favourably compare the expected NT2 situation with that at THHP when the cumulative impacts of NT2's trans-basin diversion will clearly be far greater.

12. As pointed out in the full technical review, the NT2 Environmental Assessment and Management Plan (EAMP) fails to take into account all the relevant data provided in the SDP. Many widely available studies of other hydropower dams in the Mekong region were over-looked, including of the World Bank's own Pak Mun Dam in Thailand, which was chosen as a Case Study by the World Commission on Dams and should provide many valuable lessons for NT2. The Bank consistently ignored the warnings of serious social and environmental impacts before, during, and after the construction of the Pak Mun Dam, which have been widely documented by Roberts (1993 and 2001) and at the NT2 Technical Workshop at AIT, Bangkok in August 2004, for example.

One of the lessons learned from the Pak Mun Dam should have been that it was the aquatic ecology that was most seriously impacted, resulting in numerous indirect impacts on the socio-economics of the riparian communities dependent on the river fisheries for their livelihoods. This sector has been consistently under-valued by external experts hired by project proponents. The Bank has yet to act on the recommendation of its own fish taxonomist for NT2, who stated in 1996 that: "immediate attention is needed to monitor [fish] migrations" (Kottelat, 1996). While Kottelat (1996) recommended monitoring fish populations of the most threatened species to "obtain information on their actual distribution, habitat and food requirements, spawning season and sites, and migrations if any," nine years have passed since this recommendation was made and the study has yet to be conducted. Nor has anyone studied or collected in-situ baseline data on non-fish aquatic organisms such as invertebrates, amphibians, reptiles or plants in the XBF basin, much less carried out any biological or ecological studies on any of the fish species or major habitats in either the Xe Bang Fai or Nam Theun basins. For these reasons, we conclude that "the EAMP lacks scientific and rigorous analysis of the impacts on aquatic resources" in both river basins, and has consistently ignored not only external criticism, but also its own consultants' recommendations.

13. The EAMP section on Aquatic Habitats and Fish Diversity is "based on the work done by Kottelat from 1996 to 2003" (EAMP Main Text, p.82), but the bulk of this section is still based on Kottelat's (1996) paper: "Potential Impacts of the Nam Theun 2 hydropower project on the fish and aquatic fauna of the Nam Theun and Xe Bangfai basins". Large sections

paraphrase the original work, which was written at a time when the NT2 was a smaller project requiring less water diverted into the XBF. The consultant did not refer to impacts found at other hydropower dams in the region, even though there was an emerging body of literature at the time. Since 1996, the state of knowledge has increased tremendously, and there are numerous sources which could have been included in the EAMP for comparative purposes. The fact that the EAMP overlooked several directly relevant reports that explain the significance of the Nam Phit's ecology and its role in supporting local communities (e.g. Shoemaker et al. 2001) could account for the discrepancy between its estimates and those of the SDP, which suggests that "up to 90 % of the fishery could be lost" along the Nam Phit and Huay Khama. Such discrepancies in estimating impacts to the downstream communities call into question the adequacy of the compensation plan.

The Bank's response is mistaken to say that: "The change with regard to fish loss in the Xe Bang Fai was revised from no loss in the mid-1990s to an overall current estimate of about 24% loss of fishes and other aquatic organisms". As anyone who has followed the NT2 project since the mid-1990s will acknowledge, NTPC has only recently shifted from a position of "more water equals more fish" (net *positive* benefit to fisheries) to its current modest stance that a modest decline in fisheries is anticipated. Furthermore, the "24 % loss of fish and other aquatic organisms" quoted on this reply point is presumably based on the data in Table 32-5 of the EAMP, which refers specifically to estimated fish catch and does not include all the other edible aquatic organisms that villagers routinely harvest for consumption and sale. According to the SDP (Section 32.4), "Households are expected not to be able to collect aquatic vegetation, snails, mussels and shrimp after COD". This ecological system breakdown in the aquatic food chain and total loss of whole groups of organisms currently available for human and higher order fish consumption is *not* expressed in the EAMP.

14. Rapids are known "hotspots" of fish biodiversity, aquatic bioproductivity and fishery activity at various times of year as fish migrate past these bottlenecks. They are particularly important during the dry season and during times of peak fish migration, both up and downstream. Villages have often been sited near rapids for the very reason of taking advantage of the rich fishery resources they offer on many Mekong tributaries and the mainstream. The livelihoods of those villages are highly dependent on the condition of the rapids. The EAMP admits that the rapids will effectively be flooded in the dry season and cease to be functional habitats. Yet there is no indication in the EAMP that specific studies of these special habitats have been conducted to determine such basic issues as fish productivity, catch seasonality, village economy and rapid ecology, beyond one or two isolated dry season spot samples by Kottelat. Again, this ignores one of the key lessons of the Pak Mun Dam, where thorough baseline sampling was not conducted prior to the rapids destruction (Roberts, 2001). Hence, there is no basis for the Bank's assertion that "[t]he implications for fish catch and harvesting of aquatic organisms has been factored into the design of compensation programs for the affected communities".

15. The EAMP does not consider NT2's impacts on non-fish aquatic organisms important for human consumption and aquatic ecology. No specific study of these organisms has been made in-situ, as far as can be determined from the EAMP, but an extrapolation of results from the THHP situation (itself based on secondary interviews, not direct observation), was included in the SDP.

Additionally, the EAMP makes several factual mistakes relevant to the estimated impacts on the Nam Phit and Xe Bang Fai. "The Nam Phit is dry most of the year for most of its course"

and “As there is no permanent aquatic diversity (the stream is repopulated from downstream populations during each wet season), the impact on it will be very limited.”

Compensation for Downstream XBF Communities

16. If, as seems to be the case, the NTPC surveys failed to identify a significant part of the fishery (large-scale fishing gears used during the flood recession period), then total annual catches and livelihood earnings of certain families will also be skewed on the conservative side. Furthermore, it would seem highly probable that the estimated fish catch figure for the XBF of “about 3,000 tons” (taken from Table 32-5) is a gross under-estimate of the actual present catch in the river and associated wetlands. This hypothesis is based on two principle observations:

1. The extrapolated annual fish catch from the Nam Songkhram river in NE Thailand, a river very similar to the XBF in many ways, is around 22,000 – 26,000 tons, according to a Baseline Study of Fisheries in 1999-2000 (Suntornratana et al., 2002). Both are important lower Mekong tributaries supporting major fisheries that are based on annual floods of extensive floodplain wetland complexes and uninterrupted connectivity with the Mekong mainstream for fish migrations. The XBF varies in that far more of its watershed lies in rich mountainous forestlands or is derived from karstic limestone formations that give it a naturally high pH and high aquatic productivity (CPUE’s are above those reported in other river systems in Lao PDR). It seems unlikely they could have such vastly different annual fish catch production figures (by a factor of 8).
2. It appears that the “Xe Bang Fai Socio-Economic, Health and Fisheries Survey, 2001” did not include certain important fishing gears in its format, particularly the stationary trawl nets or bag nets (*dtong*) which are commonly used on the adjacent Nam Hinboun and certain other tributaries of the Mekong. Anecdotal reports from several sources suggest that they are present in the XBF basin as well. However, as they are classified as illegal gears in Lao PDR, there is often a marked reluctance by villagers to discuss their use with outsiders. On the smaller and less productive Nam Hinboun, individual *dtong* are said to account for over one ton of fish per net per day during the peak downstream fish migration period coinciding with the flood recession period. It is inconceivable that there is not a similar amount of activity operating on the lower XBF villages in favourable locations.

If, as suspected, there are large intensive, seasonal fishing gears operating on the XBF that were not included in the 2001 XBF socio-economic survey or Warren’s CPUE studies in 7 villages, then this is a major oversight of the NT2 Project, and could mean the overall fish catch is many times larger than presently recognized. This would have profound implications on the potential level of impacts and thus, compensation levels for which the NTPC and World Bank would be liable.

With regard to its nine livelihood options compensation program, the Bank’s response claims that “There is experience in the project area and the region for each of the nine models proposed, with most households already engaged in one or more of the activities.” In fact, **all** the models proposed concerning fish raising (8 of the 9 livelihood options) would be new to the vast majority of households in the project impact area (perhaps < 5 %). Those that are practicing aquaculture in the XBF valley would be practicing low input, low risk, extensive

forms of fish culture involving trap ponds (Shoemaker et al. 2001) or in some cases, community stocked lakes. And despite there being well-established models of aquaculture elsewhere in the region, they are very rarely adopted by more than one-fifth of the households in any given community, even where infrastructure, extension and support services are available. This creates a serious dilemma as to how to replace lost protein and essential nutrients in the diets of those who will be impacted along the XBF, where up to 90 % of households are full- or part-time fishers dependent on living aquatic resources.

17. Another problem not addressed in the Compensation Plan is the unlikelihood that there will be wide take-up of the pilot options before the full impacts of water diversion are felt. Even the SDP admits: “It must be understood that the results of the pilots and ensuing scaling up implementation prior to COD can only be indicative, and not a test of the real future situation, because the Xe Bang Fai has not yet been impacted and thus there may be little incentive for riparian peoples to be fully involved in the pilot activities” (Chapter 40, p.12). At this stage of the Project, riparian communities have not been fully informed or prepared for the scale of impacts expected, and hence, it is unlikely that many people will want to take up aquaculture voluntarily while they still are catching fish and other aquatic organisms in the XBF. A villager is unlikely to be interested in a “menu of livelihood options” until the point where he/she is possibly hungry and suffering the impacts of a “collapse in the aquatic food chain,” which will only occur post-COD. By this time, 4.5 years of the fisheries compensation plan will have elapsed and there will be only 5 years left for NTPC to adequately restore the livelihoods of the impacted persons and compensate them for lost livelihoods. Experience at other regional dams (e.g. THHP and Nam Leuk Dam) show this to be a near impossible task given the complex nature of the loss and the logistical, social, political and institutional realities that exist on the ground.

18. As pointed out in the full technical review of the Xe Bang Fai river compensation measures in the SDP (Blake, 2005), the compensation proposals as they stand are: a) likely to be taken up rather slowly pre and post-COD; b) are unlikely to reach more than 20 % of households in the long term; and c) will tend to favour the wealthier households who will be the earlier adopters. These points reflect the experience of aquaculture extension projects in Lao PDR under circumstances of normal rural development project interventions. In the case of NT2, where wild fish catches will crash in a short space of time, the dynamics are even more complex, and the obstacles to mass adoption of appropriate aquaculture technology are even more formidable. At the moment, the compensation package proposed by NTPC is over-optimistic in its goals and insufficient in its consideration of alternative means of compensation should there be slow or non-adoption of aquaculture by large sections of riparian communities.

19. Nowhere before in Lao PDR has there been such an ambitious program to build capacity in aquaculture extension and support capacity to reach so many impacted households (nearly 8,000 according to NTPC estimates; several times more according to other observers), in such a brief time span (effectively 4.5 years). The experience elsewhere in rural Lao PDR has been one of gradual adoption of small-scale aquaculture technologies, often by the wealthier members of the village first, with low-input, low-output systems being the most commonly practiced types. This reflects the low agricultural surpluses available to farmers and lack of access to adequate fish seed, supplementary feed, and fertiliser. However, even with adequate on-farm resources, fish seed, and extension services in place, it is still not enough to guarantee mass take-up of aquaculture, as evidenced by much of NE Thailand, where these favorable conditions exist, but only 6 % of households are estimated to be involved in

aquaculture (Sverdrup-Jensen, 2002). The proposal to focus assistance on ensuring seed supply by expanding or building two government-run hatcheries in Thakek and at Highway 13 bridge also raises potential problems. According to the experience and recommendations of a group of small-scale poverty-focused aquaculture experts from around the region (Friend and Funge-Smith, 2002), large, centralized hatcheries, generally:

- do not reach remote areas, are too expensive and often fail after withdrawal of support; and
- deny opportunities for poor people to become involved in hatchery production and trade.

20. There is little evidence, within the Bank's response, that the lessons of the THHP experience (or indeed other hydropower dam projects in the region) have been adequately absorbed institutionally or incorporated into the SDP mitigation and compensation programme. If such lessons had been learned, NTPC would be admitting that some impacts are simply inmitigable, and that the compensation measures may take many years to develop to a point where they are able to equitably meet the needs of all the impacted persons (Blake et al., 2004). Appropriate livestock options are essential to small, resource-poor farmers, and thus should be a central part of any compensation package. Unfortunately, the proposals for alternative livestock production in the SDP don't include any modifications to previous plans that have seen only mixed success.