

LAO PEOPLE'S DEMOCRATIC REPUBLIC

NAM THEUN 2 HYDRO PROJECT

Interim Report  
Of  
The International Environmental and Social Panel of Experts

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Ministry of Handicraft and Industry  
Vientiane, Laos PDR  
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INTERIM REPORT OF THE  
INTERNATIONAL ENVIRONMENTAL AND SOCIAL  
PANEL OF EXPERTS

For the Nam Theun 2 Hydro Project  
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## ABBREVIATIONS, ACRONYMS AND GLOSSARY

ADB	Asian Development Bank
Ban	Village
GOL	Government of Lao P.D.R.
HPO	Hydro Power Office of the Ministry of Industry and Handicraft
IAG	The International Advisory Group for NT2 of the World Bank
Lao PDR.	The Lao People's Democratic Republic
LIL	Learning and Innovation Loan of the World Bank
Nam	River
NBCA	National Biodiversity Conservation Area (protected areas created by GOL Decree)
NNT-NBCA	Nakai-Nam Theun National Biodiversity Conservation Area (a portion of the NT2 Project, most of which is in the water catchment area of the project reservoir) which was created in 1993
NT2	Nam Theun 2 Hydro-electric Project
NTEC	Nam Theun 2 Electricity Consortium
NT2-WMPA	Nam Theun 2 Watershed Management and Protection Authority
Panel,	The International Environmental and Social Panel of Experts for the NT2
WB	World Bank
WMPA	Watershed Management and Protection Authority
XBF	Xe Bang Fai

## INTRODUCTION

### **The Panel, Its Role, and Previous Missions**

This is the first interim report of the International Environmental and Social Panel of Experts ( or the Panel) for the Nam Theun 2 (NT2) Project in the Lao People's Democratic Republic. The Panel's regular reports covered its visits to Laos in January and February 1997, July 1997, January 1998, January 1999, and January 2001.

Until February 2002 Panel members were Thayer Scudder, Lee Talbot and Tim Whitmore <sup>1</sup>. Tim Whitmore died on February 14, 2002, leaving a void on the PoE that will be difficult to filled. This interim report is dedicated to his memory.

The Panel's primary responsibility is to provide independent review of, and guidance on, the treatment of environmental and social issues associated with the NT2 project <sup>2</sup>. The Panel's findings and recommendations are submitted directly to the Ministry of Industry and Handicraft of the Lao PDR, and thereafter are to be made available for distribution to the World Bank, other cooperating organizations and the public. The Panel is free to make its own determination on which environmental and social issues it should focus and its area of responsibility includes the entire Nam Theun basin from the border of Vietnam to the Mekong River, the Nakai-Nam Theun National Biodiversity Conservation Area (NNT-NBCA) which is a portion of the NT2 project catchment area, proposed extensions to the NNT-NBCA, inter-basin transfers from the Nam Theun to the Xe Bang Fai and Nam Hinboun, the NT2 transmission line, and whatever enhancement and other projects are impacted upon by water releases from the Nam Theun reservoir. The Panel is also obligated to assess the extent to which planning for the NT2 project meets relevant World Bank guidelines including those for environment, indigenous people, and resettlement with development.

### **Summary of Panel Activities**

Since the 5<sup>th</sup> visit in January 2001, PoE members have read and commented on a series of NT2 project reports and documents, advised the NT2 project's lawyers and have held meetings with World Bank staff in Washington, D.C.

The main purpose of this interim mission was for Thayer Scudder of the PoE, along with David McDowell of the IAG, to join the second World Bank logging assessment mission (March 22 – 27, 2002) the results of which are reported elsewhere by

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<sup>2</sup> The Terms of Reference for the PoE are under Annex 1 of the First Report of the Panel, February, 1997

the World Bank. Prior to the logging mission the opportunity was taken by McDowell and Scudder to visit the upper, middle and lower NT2 project zones (especially Zones 10-12) along the Xe Bang Fai by foot, boat and vehicle. During the logging mission, the Ban Sailom pilot village was visited on the Nakai Plateau as well as one of the major community forest resettlement areas. An overflight by helicopter of the NNT-NBCA provided the opportunity to visit Ban Teung – a Sek village on the Nam Noy and one of three pilot villages in the District Upland Development and Conservation Project supported through a World Bank Learning and Innovation (LIL) loan.

For this interim mission the Panel member arrived in Vientiane on March 18, 2002 and departed March 28. The first three days were devoted to document review and meetings and consultations in Vientiane including with staff in the Hydro Power Office of the Ministry of Industry and Handicraft, the Director General of the Department of Irrigation, NTEC personnel, and consultants. During the March 19-21 period, visits were made to irrigation projects in the upper, middle and lower Xe Bang Fai basin as well as to four of the six Xe Bang Fai villages in which NTEC is financing pre-project benchmark studies of fishing activities.

After joining the logging mission in Vientiane March 22, McDowell and Scudder accompanied the mission in the field during the March 24-26 period where they had the opportunity to meet the Governor and Vice-Governor of Khammouane Province and the Heads of Gnommalath and Nakai Districts as well as members of the Resettlement Management Unit and the Lao Women's Union. Back in Vientiane, the PoE met with the Ambassador and Economic Officer of the United States Embassy.

### **Organization of This Report**

The primary focus of this interim report is on development projects that are either directly connected to the NT2 project, or could be connected to it as in the Xe Bang Fai and Nam Hinboun basins, on the Nakai Plateau and in the NNT-NBCA. Special emphasis is placed on irrigation, dryland farming and fishing. Because of the short time spent examining each topic, and the forthcoming May-June 2002 7<sup>th</sup> visit of the PoE that will examine topics mentioned in more detail, no recommendations are included. Certain major points, however, will be italicized.

### **Acknowledgments - Appreciation**

The Panel met with GOL officials at Central, Provincial and District levels, and project staff, as well as with representatives of the World Bank, NTEC, the Lao Women's Union and villagers and other residents in the areas visited. I wish to acknowledge with gratitude the information, advice and assistance, as well as the warm welcome, received from everyone to whom I talked. Special thanks are due to the Nam Theun 2 GOL Representative, and his staff, especially Phalim Daravong and Bounsalong Southidara and to NTEC staff for overall organization and arrangements including travel along the Xe Bang Fai and the helicopter overflights as well as to accompanying members of the Forestry Department on the logging mission. In Vientiane, the PoE wishes to thank the

Ambassador of the United States and the Embassy's Economic Officer for a visit arranged at short notice.

I am particularly grateful for the organization and arrangements made by the GOL NT2 National Project Director, Dr. Maydom Chanthanasinh who accompanied the logging mission, and to Jean Dulac, Peter Goldston and the staff of NTEC, especially Loy Chansavat and Richard Peary, who organized the Xe Bang Fai field trip and to fish biologist Terry Warren who joined us during that visit. I am also grateful to HPO's Bousalong Southidara and Mr. Hoy of the Resettlement Management Unit who joined us on both field visits as did Loy Chansavat. In Vientiane special thanks are due the Director General of the Department of Irrigation, Langsy Sayvisith, and to social scientists Charles Alton, James Chamberlain, and Gary Oughton.

## **1. Overview of Development Considerations**

From its first visit, the PoE has seen the NT2 project not just as GOL's largest development project that stretches from the Vietnam border to the border of Thailand, but also as more than just a major hydro project for the export of electricity to Thailand and for local use. As a national development project, the NT2 project has the potential to pioneer new approaches to the integration of development and conservation activities, and for poverty alleviation, not just in Lao PDR but also in other countries in the tropics and subtropics.

Especially important along the Xe Bang Fai is dry season irrigation cum fishery to improve living standards while offsetting whatever adverse affects may accompany inter-basin transfers from the Nam Theun. On the Nakai Plateau the intention of the NT2 project is significantly to improve the livelihood of the 21 communities required to shift their villages from the reservoir basin to just beyond its full storage level. Just as inter-basin transfers from that reservoir have the potential to improve livelihoods along the Xe Bang Fai, so too would they appear to have that potential for villages in the upper region of the Nam Hinboun basin.

In the NNT-NBCA, the recently established Watershed Management and Protection Authority has the potential for facilitating, in a participatory fashion, a new approach to the integration of development and conservation activities among a number of ethnic minorities living in the NNT-National Biological Conservation Area. This report will address a limited number of issues relating to each area.

## **2. The Xe Bang Fai River Basin**

### **2.1 Pre-Project Bench Mark Surveys**

NTEC is to be commended for funding the first pre-project fishery and socio-economic surveys of which I am aware that deal with inter-basin transfers in the tropics and subtropics. Commenced in 2001, a survey of the biology of the Xe Bang Fai fishery will continue for a number of years before and after the initiation of commercial

operations.

Based on a representative sample of 1,680 households living within the Xe Bang Fai basin, the socioeconomic survey was carried out during the middle of 2001. The February 2002 draft Final Report contains five chapters in addition to tabular material. Following a chapter on methodology, chapter two outlines the socio-economic situation. The following three chapters deal with health and nutrition, the socio-economics of the fishery, and an overall poverty profile. The material collected provides the necessary benchmark against which NT2 project impacts can be monitored.

## 2.1 NT2 Project Enhanced Dry Season Irrigation

Turbined waters from the NT2 power station can significantly increase the desire of villagers and the Government gradually to shift emphasis from rainy season paddy cultivation to the dry season cultivation of paddy and other crops that will be less affected by flooding and drought. During the 2000 season, for example, district officials in Xe Bang Fai District informed us that of 5,700 ha cultivated in paddy during the rainy season, 2,600 were flooded with crops completely lost in 1,800 ha. Closer to the Mekong, 71 of the 72 villages in Nong Bok district “were subjected to severe inundation...Floods were generally between 30 cm and 1.5 m high” (Shoemaker et al, 2001: 55).

The major constraint to date for shifting from wet season to dry season irrigation has been lack of water within the Xe Bang Fai where dry season flows may drop below 10 cubic meters per second ( $m^3/s$ ), and where high river banks increase pumping costs. That constraint will be removed by the turbined waters from the NT2 project. Once the project is operational, the most cost effective potential for the dry season irrigation of several thousand hectares will lie along the Nam Kathang and Nam Prit tributaries immediately below the regulating reservoir.

A sluice releasing 5  $m^3/s$  from the regulating dam will permit gravity flow irrigation to Nam Kathang villages immediately downstream, while up to 15  $m^3/s$  can be released directed into the Nam Kathang for irrigation and domestic use (including watering of livestock) further downstream. As for the 300+  $m^3/s$  that will be released down the modified Nam Prit channel that passes through the Gnommalath community irrigation project, up to five outlets will provide more reliable dry season irrigation flows for extending the existing scheme. Seeing the development/extension of such gravity flow dry season irrigation in the upper zone as his number one priority in the NT2 project area, the Director General of Irrigation estimated that he would need a year to complete the necessary soil surveys and design, indicating that time is not a constraint, provided funding is available <sup>3</sup>, since the project is not expected to be operational before 2008.

Further down the Xe Bang Fai, we visited a number of irrigation projects that lifted water from the Xe Bang Fai with electrified pumps. While most served a single

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<sup>3</sup> The World Bank is soon to become involved in several small scale irrigation projects in Gnommalath District through its Agricultural Development Project (PO65973)

village, a new scheme near bridge 13 with a lift of 31 meters was intended eventually to irrigate 2,300 hectares with 5,000 ha under command. 700 hectares were already being irrigated with farmers cultivating 1-5 hectares drawn from eight surrounding villages. In spite of the enthusiasm and initiative of local staff such a scheme at this time is a risky proposition. Aside from an excessive lift (which will not be greatly reduced by the NT2 project<sup>4</sup>) and still irregular electricity supplies, the current emphasis is on double cropping of paddy.

*It is important to note that I have referred to dry season irrigation rather than to the dry season irrigation of paddy.* Detailed research in Sri Lanka on the Mahaweli scheme, as well as elsewhere, has shown that it is not possible for small-scale farmers to move beyond subsistence by concentrating only on the double cropping of paddy. There is every reason to suspect that the same situation exists in Laos. A major reason is the low farm gate price for rice that was quoted as varying from 700 to 1000 kip/kg. Another reason is apt to be a build up of pests – a problem already reported after four years of electrified dry season paddy upriver from the Nam Prit junction with the XBF in Ban NaKieo and Ban Somsanouk. Though suggested, use of insecticides will only make the economics more problematic.

While villagers told us that they were prepared to experiment with other irrigated dry season crops, their immediate goal was to reach rice self sufficiency in order to offset the not infrequent annual shortfalls of a majority of villagers. Thereafter a range of crops were mentioned of which maize would appear to be especially important as both a cereal staple and fodder for large livestock which we were told on reliable authority were one product where demand in Thailand gave comparative advantage to Laos.

Other crops mentioned were soya and other legumes, chilies, onions, garlic, vegetables, and fruits. *However in all such cases, careful marketing studies are essential before villagers are encouraged to make major investments.* Perishables such as some vegetables and fruits easily saturate local markets until prices drop below costs of production. Though a soya factory was mentioned as a reliable market source in Savannakhet, reliance on a single such installation can be a risky proposition. The same applies to marketing department guarantees if the necessary marketing studies have not been completed.

## 2.3 Fishery and River Bank Gardens

### 2.3.1 Fishery

Though the conventional wisdom stipulates that more water from the NT2 project will produce more fish in the Xe Bang Fai, such fishery experts as Ian Baird, Tyson Roberts and Terry Warren believe that major increases in dry season flows from turbinated waters are apt to have the opposite effect. That major difference in opinion is one reason

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<sup>4</sup> In the upper zone of the Xe Bang Fai, turbinated flows during the dry season can be expected to increase water levels up to 3.5 meters as opposed to one meter closer to the boundary between the lower and middle zones.

why the current pre-project surveys of the biology and socio-economics of the current fishery are so important.

Though NTEC informed the PoE that adequate water quality studies are being undertaken in the Xe Bang Fai, the PoE wishes to ensure that these are more closely tied to the fishery studies. The same applies to the impact of turbined flows during the dry season on plants within the primary channel. Though evidence is lacking as to its importance to the fishery, especially significant according to Terry Warren may be a common species that is rooted in the rocky bed of the Xe Bang Fai. Inundated during the flood season, and above water during the dry season, it may not be able to adapt to increased inundation during the dry season.

### 2.3.2 River Bank Gardens

Shoemaker et al (2001: 27) make the useful distinction between two overlapping periods of dry season riverbank cultivation. On the upper slopes, the first extends from August-September to December. It includes a range of longer maturing crops including maize, various tubers including sweet potatoes and cassava, legumes and a wide range vegetables. Involving the lower slopes, the second period begins in December and involves the cultivation of crops with a shorter cultivation season. At the time of the Panel's March visit, most crops on the upper slopes had been harvested, with stubble showing the importance of maize. Tobacco was the major crop seen along the lower slopes along with small patches of vegetables.

Though they can have major importance for specific households, generally speaking river bank gardens along the Xe Bang Fai were of less importance than I had expected. Steep river banks are one reason. Another is their heavily eroded nature in the upper and middle zones where the negative impact of dry season, turbined flows to river bank gardens can be expected to be greater. A third reason mentioned by some villagers was the increasing importance of dry season irrigation that they claimed was responsible for less river bank cultivation. Furthermore, at least during March 2002 it was clear that cultivation on the upper slopes (which will be less affected by turbined flows) was of considerably more importance than more vulnerable lower slope cultivation.

## **3. The Reservoir Basin on the Nakai Plateau**

### 3.1. The Pilot Village at Ban Sailom

One afternoon was spent gaining familiarity with the pilot village site and attending a meeting of approximately 20 men and five women at the temporary house of one of two families who have already taken up residence at the 16 hectare site. While most of the land had already been cleared, felling of trees on some of the 0.5 ha garden plots was continuing during our visit. The site was also being fenced to protect the gardens against foraging wildlife. Before the arrival of the rains, NTEC was planning to complete the improved access road and the provision of electricity. In April 2002 the district and provincial authorities were planning to provide each household with a land

title.

Though progress has occurred since the PoE's January 2000 visit, World Bank delays in proceeding with project appraisal have slowed forward movement and increased resettler impatience and skepticism.

### 3.2 Inter-basin Transfers for Periodic Irrigation from the NT2 Reservoir to the Upper Portion of the Nam Hinboun.

While discussing ways in which NT2 could catalyze a wider range of multi-purpose development initiatives, David McDowell and I arranged for a helicopter flight over the Nam Malou portion of the reservoir. From the air, it is clear that one of the bunds to be constructed to keep water in the reservoir will be located close to the escarpment and a small stream that cascades down the escarpment into the upper portion of the Nam Hinboun basin. Though a number of villages there have prepared land for rainy season paddy cultivation, no dry season irrigation was seen due to water scarcity. That deficit in what we were told was a hunger-prone area could be corrected by building a sluice in the bund and an holding reservoir for rainy season flood waters from the NT2 reservoir at the base of the escarpment for the dry season gravity-flow irrigation of several hundred, and perhaps more, hectares. Though NT2 reservoir water could not be expected every year, and tradeoffs with other uses down the Nam Theun would have to be considered, the amount of water required would be small and presumably available during years of heavier rainfall and flow into the NT2 reservoir.

The attractiveness of such a project in the upper portion on the Nam Hinboun basin is enhanced by two other considerations. One is the existence of a nearby track down the escarpment which is being improved to foster ecotourism into the upper portion of the Nam Hinboun basin so as to gain access to the cave through which the Nam Hinboun flows. The other consideration is the possibility of funding through the Asian Development Bank.

Such a Nam Malou-Upper Nam Hinboun water transfer is only one of a number of ways in which the NT2 project might be able to increase poverty alleviation among a larger number of people.

## 4. The Nakai-Nam Theun NBCA

As with the Nakai Plateau, my visit to the NNT-NBCA was primarily in connection with the logging mission. During overflights, some team members were concerned by what appeared to be an increasing amount of swidden (bush-fallow) cultivation extending out from the various settled tributary areas. I was less concerned, believing that swidden must remain a component in whatever diversified household and community livelihood system is developed for the resident population in order to combine the necessary degree of development with the necessary degree of conservation.

On returning to Vientiane, David McDowell and I discussed the situation with

three social scientists (Alton, Chamberlain and Oughton) who have worked with local livelihood systems in the NNT-NBCA. All three rejected the conventional view that swidden in the area was bad and should be phased out. On the contrary, they believed that the customary swidden system involving rotating fields within a ten or more year fallow system increased biodiversity. Not only were different successional stages associated with a more varied and increased flora and fauna, a situation that I know also characterizes tropical and subtropical Africa, but also with an improved intake of protein by villagers who set snares to catch wildlife attempting to access rice fields. They were also of the opinion that there was insufficient water and land in much of the catchment to provide sufficient paddy to replace swidden cultivation.

The problem they agreed was not swidden cultivation as such but rather government land registration policy according to which fallow land was taken from local use if it was not cultivated during a three to four year period. As a result swidden cultivators to whom the government regulations are applied are forced to reduce longer customary fallow periods to short three year fallows with the result that soil fertility and yields decline and land degradation increases.

The dilemma for swidden cultivators is well described in the ADB's December 2001 *Participatory Poverty Assessment: Lao People's Democratic Republic* which included Nakai District. Noting that villagers perceive poverty as something 'new,' the ADB study outlines a number of responsible factors that are largely beyond village control. Included are war, natural disasters, increases in pests and two government policies – relocation and the Land-Forest Allocation Program. Influenced by the Land Law since 1997, the Land-Forest Allocation Program is considered to be the worst problem since it limits customary 14-15 year fallows to an average of three to four years. Under such a short period, according to the study, "rejuvenation of biomass and soils is insufficient for forest regeneration" (xv). Villagers in the study were well aware of the problem. According to one, "Prior to the land allocation, our village produced enough rice to last the entire year. Now, we can only produce enough rice for five months of the year" (ibid 35).

The PoE does not know the extent to which the Forest-Land Allocation program has been applied to the NNT—NBCA. That is a topic which should be explored in detail during the PoE's forthcoming May-June 2002 visit as part of the PoE's emphasis on possible livelihood systems for the Watershed Management and Protection Authority including the role of swidden cultivation in such systems. Here it may be significant that the PoE was told by villagers in 2001 in one of the three LIL pilot villages that they now practiced 3-4 year rotations as opposed to the longer ones that I had expected to have been the case. *There may well be a greater need for policy flexibility on the part of the Government, the WMPA, and the LIL than has hitherto been the case.*

After a slow start, the LIL is now implementing a range of important development and conservation activities. A one year extension has been requested beyond the current September 30, 2002 termination date. *Looking to the future, continuity in the type of development and conservation activities involved is essential to avoid the setback that characterized the previous gap between IUCN-initiated and current LIL activities.*

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## Annexes

### 1. Next PoE Mission

The next PoE mission is scheduled to begin on or about May 23, 2002. It would be desirable for that visit to be preceded by an overlapping visit of the International Advisory Group. During the PoE's visit, emphasis will be placed on appropriate development and conservation activities for the Nakai-Nam Theun NBCA and on the new Watershed Management and Protection Authority. Weather permitting, side trips such as visiting the Nam Malou-adjacent Nakai Plateau escarpment - upper Nam Hinboun basin area will also be included.

### 2. Comments on Shoemaker, Baird, and Baird's 15 November, 2001 "The People and Their River: A Survey of River Based Livelihoods in the Xe Bang Fai River Basin in Central Lao PDR."

The authors' "The People and Their River" is a well written and informative introduction to village livelihoods within the Xe Bang Fai Basin. It draws on discussions with people from over 30 villages, 24 of which were visited in February-March 2001. 120,000 to 150,000 people are estimated to utilize the resources of the basin, approximately 50,000 of whom live in 125 or more villages adjacent to the mainstream.

The survey's principal section deals with river-based livelihoods including fisheries, dry season river bank gardens, forests and livelihoods, rainy season rice-based agriculture, and domestic livestock. Briefer sections deal with such topics as the people of the basin, social services and rural infrastructure, women, and external development interventions.

Found very useful by Terry Warren and myself, the most detailed information deals with fish, other aquatic resources and their habitat including seasonably flooded forests and a range of local fishery management systems. When compared with findings in the more quantitative NTEC-funded Xebangfai Survey 2001 and our own March 2002 field trip, the weakest component of the survey is a five page section on dry season rice-based agriculture. While correctly noting associated risks, the authors inadequately compare these with flooding and drought risks associated with rainy season cultivation. They also, in my opinion, incorrectly assess local attitudes toward dry season paddy and other crop irrigation and the importance to villagers of such cultivation. While we found strong village support for dry season irrigation and village increases in its extent, the authors' analysis gives the opposite impression. The authors also appear to be unaware of the impact, for better and worse, that dry season irrigation is having on the livelihoods of villages in all three Xe Bang Fai zones.

In the most densely populated lower zone, for example, total consumption and income from dry season paddy exceeds that from wet season paddy according to the NTEC-funded survey (Table 8 on page 22). Other impacts include increased purchase of two-wheeled tractors, sale of buffalo, and reduction in the use of river bank gardens. Some of these impacts are worrisome, especially if current expansion of electric pump-based irrigation is as “increasingly problematic and questionable” as the authors believe (xvi-xvii). As emphasized earlier in this interim report, that assessment could prove correct in the absence of a gradual diversification into higher value crops and adequate marketing surveys. Though the release of turbined waters from the NT2 project could have a major beneficial effect in all three zones after 2008, in the meanwhile careful monitoring of the implications for village welfare of the current situation is essential.