

LAO PEOPLE'S DEMOCRATIC REPUBLIC

NAM THEUN 2 HYDRO PROJECT

**THIRD REPORT OF THE
INTERNATIONAL ENVIRONMENTAL AND
SOCIAL PANEL OF EXPERTS**

Thayer Scudder

Lee M. Talbot

T.C. Whitmore

**Ministry of Industry and Handicraft
Vientiane, Lao PDR
Reissued with corrections January 21, 1998**

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CONTENTS

Introduction

The Panel, Its Role, and Previous Missions

Summary of Panel Activities

Organization of this Report

Acknowledgments - Appreciation

Abbreviations, Acronyms and Glossary

1. Overview of the Project

2. Most Urgent Issues

2.1 An Integral Unit from the Vietnam Border to the

Mekong:

Institutional Considerations

2.2 Availability and Continuity of Funding

2.3 The Critical Issue of Capacity

2.4 Joint Lao-Vietnamese Conservation Initiative

2.4.1 World Heritage Status

2.5 World Bank Role and Involvement

2.6 Hmong Populations along the Northwest Border Area

3. Other Important Considerations

3.1 Conservation Issues in the NNT-NBCA

3.1.1 Controls of Hunting and Forest Products

Collection

3.1.2 Zoning

3.1.3 Extensions of NNT-NBCA

**3.2 Project-Affected People on the Nakai Plateau and NNT-
NBCA**

3.2.1 Nakai Plateau - NNT-NBCA Linkages

3.2.1.1 Planning and Implementation

3.2.1.2 Experimental Farms/Community Development

Centers

3.2.2 Community Stabilization

3.2.3 Increasing Community Participation

3.2.4 Communications

- 3.2.5 Use of RAP to Encourage Movement of Population Out of the NNT-NBCA
- 3.2.6 Ban Ka-Oy as a Frontier Community
- 3.2.7 Initial Limitation of Benefits to Project Affected

People

- 3.3 Effect of Reduced Discharge Below the Dam
- 3.4 Effect of Increased Discharge on the Xe Bang Fai Area
- 4. Continuing Activities of the Panel
- 5. Annexes
 - 1. Itinerary of the Third Mission of the POE
 - 2. Map of Areas Visited by 3 Missions of the POE
 - 3. Map of General Area
 - 4. Rodent Plagues
 - 5. Observations on Route 12
 - 6. Diagrams of Water Transfers of the NT2 Project

INTRODUCTION

The Panel, Its Role, and Previous Missions

This is the third report of the International Panel of Environmental and Social Experts (POE or the Panel)¹ for the Nam Theun 2 (NT2) Project in the Lao People's Democratic Republic. The Panel's first report covered its first visit to Laos from January 24 through February 7, 1997. The second report referred to the Panel's second visit from July 19 through 26, and the present report covers the Panel's third visit in the period of January 2 through 17, 1998.

The Panel's Terms of Reference cite its primary responsibility as "to provide independent review of and guidance on the treatment of environmental and social issues associated with a project under preparation," and the POE's findings and recommendations are to be submitted directly to the Ministry of Industry and Handicraft². The Panel is free to make its own determination on which environmental and social issues it should focus. The POE interprets the area of its responsibility to include the entire Nam Theun River 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

¹ The Members of the Panel of Experts are:
 T.Scudder, PhD (Harvard), California Institute of Technology, USA
 L.M.Talbot, PhD (Berkeley), George Mason University, Virginia, USA
 T.C.Whitmore, PhD, ScD(Cambridge), DSc(Oxford), Hon.Dr (Ehime), Cambridge University, UK

² The Terms of Reference for the POE are under Annex 1 of the Panel's First Report, February, 1997.

catchment area, proposed extensions to the NNT-NBCA, interbasin transfers from the Nam Theun to the Xe Bang Fai and Nam Hinboun rivers, 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

The Panel members arrived in Vientiane on January 2. In the following 12 days the Panel traveled through the area of its responsibility, primarily visiting portions of the area which it had not seen on previous visits. Among the visits were the following (see Annex 1 for detailed itinerary):

- Three days, primarily by boat, on the Xe Bang Fai to visit villages and agricultural areas and to consider the impact of water to be discharged from the reservoir;
- One day by road on Route 12 to the Vietnam border, seeing part of the resettlement area 4B, the Hin Namno NBCA and the proposed eastern corridor which would link it to the NNT-NBCA.
- Two days on the Nam Theun proceeding by local boat and on foot down the gorge between the dam site and confluence of the Nam Phao to visit the dam site and proposed NBCA southern corridor extension and to consider the impact of the reduced discharge from the NT2 dam;
- An extensive overflight by helicopter to view the proposed southern corridor extension, most of the NNT-NBCA, the dividing hills and areas of settlement and agriculture; stops were made in villages and primary forest high in the NNT-NBCA;
- Three days by raft, foot and local boat from Ban Vangchang down the Nam Theun through the NNT-NBCA to the Theun Douane demonstration farm.

During all or most of this trip the Panel was accompanied by Loy Chansavat (NTEC), Noulinh Sinbandhit (STENO), Phalim Daravong (NT2 Representative's Office), Sanesay (CPAWM), Robert Goodland (World Bank) and Peter Goldston (NTEC). Those who accompanied the Panel during the helicopter trip and/or visits on the Nakai Plateau included Jean-Christophe Delvallet (NTEC), Gary Oughton (ECOLAO), William Robichaud (WCS), and Stephen Sparkes (NTEC).

The final three days were spent on consultations and review of reference information in Vientiane and in preparing this report and briefing officials.

This is the third of the projected series of missions to Lao PDR by the Panel under its Terms of Reference. The first and third missions have been in the dry season and have involved extensive travel by foot, raft, local boat, helicopter and 4-wheel drive vehicles. Through these visits the Panel now has first-hand experience with much of the entire area of its responsibility (see Annex 2) from the Vietnam border to the Mekong, including:

- The NNT-NBCA including the dividing hills, the settlements and agricultural areas, tributary rivers, and parts of the primary forests;

- The proposed northern extension and also the proposed corridors which would link the various NBCAs.
- The Nakai Plateau including the inundation and resettlement areas, villages, the Nam Theun damsite and the demonstration farms;
- The Nam Theun downstream from the damsite to the Theun Hinboun Dam;
- The Xe Bang Fai basin including the location of the powerhouse and downstream waterway, resettlement area 4B, and the Xe Bang Fai and surrounding areas, villages and cultivation, from above the point of discharge of project water to the river's confluence with the Mekong.

The second mission which was in the wet season included visits to five additional hydro-electric projects in southern Laos, and a visit (by one member) to an additional hydro project in the north and two villages within the NNT-NBCA. The objective of these visits was to enable the Panel to compare the NT2 Project and other hydro-electric projects in the country, and to give the Panel additional perspective for evaluating the environmental and social aspects of the NT2 project in the Laotian context.

Organization of this Report

Following a brief overview of the project, the main body of the report is organized into two main sections. The first covers the points which the Panel believes require the most urgent attention. These are the issues which require action of some type in the near future in order to assure the best chance for the success of the project as a whole.

The second part presents what the Panel believes to be other important considerations, most of which represent issues where there has been planning effort and there is now need to move to active implementation, or issues on which the Panel has reached preliminary conclusions (e.g., impact of changed discharges in watercourses). While these are not listed as "most urgent", they still represent issues which the Panel believes need attention relatively soon (e.g., conservation actions to stem the loss of biodiversity in the NNT-NBCA)..

The Panel wishes to emphasize that the actions recommended in this report are not to be used to further delay the World Bank appraisal and approval process. In most cases the Panel's recommendations should be incorporated in Project documents (e.g., the Watershed Management Plan and Resettlement Action Plan) which are currently under revision, and which the Panel will review when they are ready later in 1998.

As with the second report, the Panel felt that this third report would be most useful if it focused on a limited number of issues. The Panel's first report (February 1997) should be consulted for a more comprehensive overview and description of the Nam Theun 2 Project and broader perspective on the environmental and social issues involved.

Acknowledgements – Appreciation

In its activities which are summarized above, the Panel met with GOL officials and project staff, as well as with representatives of UNHCR, relevant national embassies, private sector firms, IUCN, non-governmental organizations (NGOs), and villagers and other residents of the NNT-NBCA and other areas visited. We wish to acknowledge with gratitude the information, advice and assistance, as well as the warm welcome that we received from everyone to whom we talked. Special thanks are due to the Minister of the Ministry of Industry and Handicraft, the Nam Theun 2 GOL Representative, the President of STENO and to those in the World Bank, NTEC, IUCN, NGOs and project-affected villages who provided the benefit of their knowledge and insights.

We are particularly grateful for the extraordinary efforts which GOL and NTEC made to arrange and carry out the field travel which made it possible to see and accomplish so much in a short time under extremely difficult conditions. In particular, Loy Chansavat and Peter Goldston of NTEC organized the food, field transport and camping, and Phalim Daravong of the NT2 Representative's Office and Noulinh Sinbandhit of STENO, and Sanesay of CPAWM provided invaluable assistance throughout the entire field trip.

ABBREVIATIONS, ACRONYMS AND GLOSSARY

CPAWM	Center for Protected Areas and Watershed Management of the Department of Forestry, Ministry of Forests and Agriculture
GOL	Government of Lao P.D.R.
IUCN	International Union for Conservation of Nature and Natural Resources
Lao P.D.R.	The Lao Peoples' Democratic Republic
Nam	River
NBCA	National Biodiversity Conservation Area (protected areas created by GOL Decree).
NGO	Non-governmental Organization
NNT-NBCA	The 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	The Nam Theun 2 Hydro-electric Project
NTSEP	Nam Theun Social and Environmental Project (of the World Bank).
Panel, POE	The International Panel of Environmental and Social Experts
RAP	Resettlement Action Plan of 1997
STENO	Science, Technology & Environment Organization of GOL (which reports to the Prime Minister's office)
WB	World Bank
WCI	Watershed Conservation Institution
Xe	River

1. OVERVIEW OF THE PROJECT

Nam Theun 2 (NT2) is a project to build a large dam and produce hydropower by interbasin transfer of water from the Nam Theun to the Xe Bang Fai. The affected region extends from the Vietnam frontier at the crest of the Annamite mountain chain down through a large area of mostly pristine tropical evergreen forest to the heavily degraded Nakai plateau, then westwards across the lowland plains of the Xe Bang Fai and Nam Kading to the Mekong. A shallow reservoir of 450 sq.km will flood 40 percent of the Nakai plateau whose 4500 indigenous inhabitants will be resettled with enhanced lifestyles on its southern fringe. The forested catchment is the Nakai Nam Theun National Biological Conservation Area (NNT-NBCA) and is 3710 sq.km in extent. It is drained by five main rivers (Annex 3) all of which have villages of indigenous people along them, numbering at least 5,000. The forests are rich in wildlife including tigers, elephants, gaur and also five newly discovered mammal species which are confined to the NNT-NBCA and its environs. The forests are rich in plant species though these remain mainly uninvestigated. It is proposed to link the existing NNT-NBCA by corridors to a new proposed NBCA to its north, to the Khoummaone Limestone NBCA to the west, and to the Hin Namno NBCA to the south east, in order to create a Nakai Nam Theun Conservation Area which will be managed as a single unit. The electricity company (NTEC) will provide \$US30 million over 30 years (\$US14 million at 1997 values) to assist conservation of biodiversity, enhance the lifestyles of the residents, and to minimize erosion (which could otherwise seriously reduce the life of the shallow reservoir).

In its second report of July 1997 the POE strongly encouraged World Bank (WB) support of the project. The WB International Advisory Group subsequently added its endorsement. The POE considers that WB involvement, backing the private sector, gives the best chance for conservation of the globally important biodiversity and physical integrity of the catchment forests and for providing the project-affected inhabitants with sustainable livelihoods in equilibrium with the environment.

The wider significance is that NT2 is an important pilot project for Lao PDR, WB and globally.

For the Lao PDR the NT2 has the potential to: (1) provide a model of resettlement with enhanced lifestyles matching and probably exceeding WB Operational Directives; (2) stabilize areas occupied by swidden (slash and burn) farmers through intensification and diversification of their agriculture on scales involving several villages; these areas occur within NNT-NBCA and to its immediate west on route 8B east of Laksao and are occupied by indigenous and recently arrived (Hmong) people respectively; (3) provide a management model for other NBCAs of which Lao has about 20; and (4) provide a model for major development projects involving environmental and resettlement issues.

For WB NT2 is a pilot project for joint involvement with the private sector in a major infrastructure development using WB Operational Directives to provide benchmark standards on the BOOT (build, own, operate, transfer) principle.

For the world, NT2 is a chance successfully to demonstrate the combination of beneficial changes for indigenous peoples with biodiversity conservation in a major hydropower project that benefits the whole of Lao PDR as well as the interests of global biodiversity.

2. MOST URGENT ISSUES

2.1 An Integral Unit from the Vietnam Border to the Mekong River: Institutional Considerations

If the NT2 project is to realize its potential as both a hydro project and as a project for the sustainable conservation and development of two river basins, there must be a GOL institutional framework that can formulate and enforce policies for a project area stretching from the Vietnam border to the Mekong River. To be effective such a framework must have both the support of the highest levels of government and sufficient funds. Such a framework does not exist at the moment. What is present is a range of smaller and/or separate existing and proposed institutions and committees for which there is inadequate funding and personnel and between which there is inadequate linkage and/or coverage.

Institutional frameworks must be adapted to national conditions. The POE agrees that in the Lao PDR case the creation of a completely new organization such as a river basin authority probably is neither desirable nor feasible. On the other hand, POE discussions with government officials and a wide range of experts on what might be an appropriate framework produced a variety of often conflicting or incomplete suggestions. Major problem areas were linkages between local people at the village level and central decision makers, between central government and the provinces, and between the NTSEP Charter for a NT2 Watershed Conservation Institution (WCI) and the type of broader institutional framework that the POE considers necessary.

The World Bank's current view is that GOL approval of the WCI Charter is required before the Bank will proceed with appraisal of the NT2 Project. The POE questions that schedule. This is because the importance of the NT2 project, the difficulties (including political difficulties) of creating new organizations, and the probability that institutional arrangements enacted will be applied later to other watersheds and river basins, it is imperative that premature decisions about critical institutional matters not be forced on the GOL. What the POE believes is necessary is to embed the charter within the type of wider institutional framework suggested below. The charter itself needs further review and revision involving public consultation.

While the conceptualization of appropriate institutional frameworks, including the more limited one for watershed management, should not be a condition of appraisal, the POE recommends that the existing Central Working (Steering) Committee, under the Chairmanship of the Minister for Industry and Handicrafts, accelerate the necessary discussions within the Government.

At the watershed level those discussions should be coordinated with ongoing planning for the Nan Ngum Watershed, and especially through participation in the January 27-28, 1998 Workshop on Watershed Management. Among other topics, this workshop will consider a number of institutional arrangements for watershed management including a cabinet-level forum chaired by the Minister of Agriculture and Forestry. Both have obvious relevance to the NT2 Watershed.

At the Nam Theun / Xe Bang Fai river basin level at least two alternatives have been suggested that the POE believes warrant careful consideration. One is the establishment of three provincial policy planning and implementation units (one per affected province) which would be coordinated through the Prime Minister's Office with the advice of the Central Working Committee. Such provincial units would have the benefit of further decentralizing decision making and policy implementation to the provincial and district levels, with each unit chaired by the Provincial Governor and composed of representatives of the relevant ministries, mass organizations and other relevant institutions.

The second alternative would involve such modifications to the current Central Working Committee as having the Minister, Industry and Handicrafts and the Minister, Agriculture and Forestry, as co-chairs. The current Resettlement Unit could also be incorporated either as a separate unit or, so as to avoid the known problems associated with the creation of a new agency, within MAF's Accelerated Rural Development Unit. As with the first alternative, the Central Planning Committee would involve the three provincial governors and report to the Prime Minister's Office.

Both alternatives have weaknesses that must be addressed, a major one being linkages between central, provincial, district, and, especially, community levels. While not recommending either institutional framework, the POE believes both represent the type of framework that is required if the potential of the NT2 project problem areas were linkages be and as an international model, e level and cented. Such a framework must have both political clout and adequate financial support. The POE also suggests that it also might have a "twilight clause" requiring its functions to be handed over to line ministrOE considers necher organizations as community natural resource management institutions after a suitable interval.

2.2 Availability and Continuity of Funding

In the Panel's previous report we registered our concern with the availability and adequacy of funding needed especially for conservation. The Panel now feels that we must reiterate and strengthen our statement of concern with the funding for the preparation and initiation of the project as a whole. Because of delays, apparently largely caused by the World Bank, there have been serious breaks in the continuity of funding both for the conservation planning and implementation, and in other aspects of the project such as the nework suggesteddemonstration farms.

Because of discontinuity of funding the IUCN efforts were held in abeyanile the

conceptualization of a post to another position. IUCN now has been promised funding for an additional eight-month period, but with no assurance that at any time, the POE will be another halt in funding and operations and probable loss of key personnel. Essentially the same thing has happened with the demonstration farms which are central to the success of the resettlement. There is a need for additional funding since June of 1997.

Continuity is all important in a project such as the NT2. It is all the more crucial in a country such as Laos with limited internal funding, facilities, staff and resources. On the one hand of institutional arrangements and staff and have them obtain funding a cabinet-level so that they are effective. Breaks in continuity of funding lead to losses of good, trained staff, and make it that much more difficult and inefficient to find and train replacements when the funding starts up again. Worse, breaks in continuity of funding of resettlement efforts undermine the trust and enthusiasm which can be built over time in the affected populations, and can lead to inefficiencies and failures in the resettlement process itself. Discontinuities and delays in funding also can lead to serious impacts within the host government. This is especially true with a small country with very limited resources. The Government agencies or other units which commit staff, resources and political capital to a project find themselves and their position within the government undermined when funding is delayed, uncertain or fails.

Consequently, the Panel emphasizes most strongly that if the project supporters are serious about achieving success with this internationally important effort, funding for this project needs to be made available quickly, it must be adequate, there must be continuity rather than stops and starts, and there must be recognition that success will require a long-term, sustained and adequately financed effort. A further consideration is that the urgently-needed funding for most aspects of this project should be on a grant basis.

2.3 The Critical Issue of Capacity

The management arrangements for the NNT Conservation Area and for the rest of the project will be the key to its overall success. Management is considered in depth in the documentation, especially (for the NNT Conservation Area) in the IUCN 1997 *Management Strategy*. Adequate capacity is absolutely central to the success of management. The issue of capacity building has been recognized as critically important and urgent by virtually all who have examined and commented upon the project. Although the Panel has emphasized this need in its previous reports, the matter is of such urgent concern that we must re-emphasize it. Our deep concern with this issue stems in part from our experience with other projects throughout the world, where adequate capacity has proven a key to success or the converse. And our concern has been heightened by the examples of other hydro projects in Laos where capacity clearly was in short supply. The NT2 project is very much more complicated and demanding than these other projects, in large part because of the exemplary attention which is being given to its environmental and social aspects. As a consequence the demands for trained and capable personnel will be substantially greater. Training both in and out of country takes time. There is real urgency in initiating needed training and other capacity building efforts.

Consideration should be given to several different approaches to capacity building. There is need for advanced training, probably at the Masters degree level, for several individuals a year for many years. Once support can be found for such training it will require about two years to complete. In-country training for different levels of management from the community level up to the central government can be provided by existing institutions and also by development of training courses specifically designed for the needs of the project. Consideration should be given to obtaining expatriate trainers, as well as for obtaining expatriates on temporary assignments where local expertise is not available. In such cases a central and explicit part of the assignment must be providing in-service training to counterparts, who are to phase into the positions within a specified time period. Consideration should also be given to using other available training resources, such as carefully selected military units or personnel to provide training for those who are to take over protection of the NBCAs.

2.4 Joint Lao-Vietnamese Conservation Initiative

The Panel understands that one meeting pursuant to this initiative was held in early 1997 and that additional activities are under consideration. The Panel considers that actively developing and expanding this initiative is particularly important for the success of the whole NT2 project. In view of the impact which trans-border hunting and trading in wildlife and collection of other forest products has on the biodiversity in the NBCA there is an increasingly urgent need for effective control. Because this is an international issue such control is best achieved by joint international cooperation, and the Panel recommends that this be pursued vigorously. Among other actions, the possibilities for an international park straddling the frontier, or contiguous national parks should receive early consideration. Such border parks are being increasingly established throughout the world, and national park status would be compatible with and complementary to World Heritage status. Clearly, all such discussions require considerations of adequate and hopefully collaborative protection of biodiversity along the border.

2.4.1 World Heritage Status

As noted in our previous two reports, there has been consideration of World Heritage Site status for the NNT Conservation Area and adjacent areas in Vietnam, including the Vu Quang protected area. The Panel believes that action should be taken without delay to establish the area under this international status. The degree of international recognition accorded by World Heritage status can help provide stability in international border areas. It can assist with additional protection through possible international financial support, both through the World Heritage Fund and from other donors, and it can provide additional pressure for protection on both sides of the border.

The Panel understands that concern has been expressed within Laos that consideration of World Heritage status could delay World Bank appraisal and approval of the NT2 Project. We wish to emphasize strongly that this is not the case. On the contrary, we believe that by helping to assure the integrity of the NNT-NBCA, World Heritage status could accelerate progress in project approval.

2.5 The World Bank Role and Involvement

The World Bank's role is central to the success of the NT2 project. The Panel would note also that the success of the project is important to the Bank, particularly in terms of the role of NT2 as a pilot or pioneering project. The Panel believes that to assure the success of this project the World Bank will need to increase and improve its involvement.

As previously noted one major area of improvement must be in continuity and promptness of participation. Regardless of the reasons for the delays in Bank actions leading to appraisal and approval, we believe that the effects already have been significant and unfortunate. It is most important that there be no further delays in procedures and discontinuities in support. The Panel also wishes to reemphasize that substantial additional grant funds are needed now and in the near future to assure that the various aspects of this complex project are implemented in a timely and effective fashion.

As the project develops there will be need for substantially increased participation of the Bank at the country level. Consequently, we believe that the Bank will need to assign at the minimum two additional staff to the Resident Mission in Laos. One would be administrative and managerial, to serve as local project manager/coordinator for the Bank. The other would be a technical position, an environmental specialist to look after the environmental and social issues involved. As the Bank's involvement in Lao P.D.R. increases (as the Panel trusts that it will) there will be additional needs and duties for these and other staff.

2.6 Hmong Populations Along the Northwest Border Area

There has been a significant increase in the Hmong population adjacent to the NNT-NBCA and the corridor to the Khammouane Limestone NBCA. During its first visit in January 1996 the POE encountered Hmong living within the Northern Extension and visited a major Hmong Village along Route 8 to the Vietnam border. Many men had guns and it was common knowledge that they hunted within the entire length of the northwest portion of the NNT-NBCA from the Vietnam border to the Nam Theun.

As the Hmong continue to move itoward the southeast, within the past two years the number of villages within approximately 20 km of the Nam Theun between the NT2 damsite and the confluence with the Nam Phao is said to have increased from one to three, while one estimate has the number of families increasing from around 50 to several hundred in this short period.

While rafting down the Nam Theun this year, the POE first met Hmong using bamboo rafts to fish the Nam Theun a few kilometers below the dam site. In one three kilometer stretch of river further downstream, seven recently occupied camp sites were counted along the right bank of the river which was bordered by a path. At several points paths went inland to provide river access to the various Hmong villages.

Granted the serious threat that an expanding Hmong population poses both to the area's biodiversity and population stabilization, there is an urgent need to initiate two tasks this year. The first is to clarify the situation by assessing the number of villages and families involved and the recent histories of their movements, including location of their most recent previous village sites. The second is to commence planning and implementation, with active Hmong participation, of ways in which the existing population can be stabilized within an area that includes not just their current villages but also -- to the extent possible -- their more recent village sites. The planning process must also include explanations as to why hunting within the northern extension, the NNT-NBCA and the Khammouane Limestone corridor is no longer permissible while implementation should include not just the collection of guns but also a sustained training program whereby Hmong from each community are trained as natural resource managers and protectors.

The POE realizes the difficulties involved in completing both tasks. On the other hand, there is reason to expect that a concerted and ongoing approach to the problem can be successful. Throughout their history the Hmong people have shown a major capacity to adapt to new situations, one example being the prominent role that dry and wet season rice irrigation currently plays in the economy of the Route 8 village visited by the POE during 1997, and the Hmong experience with terraced rice cultivation in Vietnam and China.

The methodology and technology also exists for participatory planning and implementation of stabilization strategies. While these have been applied to individual villages, the challenge here is for the NT2 Project, as a national project, to serve as a pioneering pilot project for population stabilization of entire areas that include not just Hmong but also inholders within the NNT-NBCA and on the Nakai Plateau. Use of blown up (1/5,000) aerial photographs allows planners to assess, with community members, the resource base associated with each village and facilitates community selection of such stabilization strategies as dry and wet season rice irrigation and swidden rehabilitation based on various agro-forestry techniques. In the Hmong case, it may be possible to so rehabilitate recently deserted village sites with associated swidden areas to the extent that the Hmong movement toward the south east and within Khammouane Province can be at least partially reversed. At the same time it is also essential for community development workers living in each community to work closely with the Lao Women's Union to pursue an active program of family planning that will reduce the current rate of population increase.

3. OTHER IMPORTANT CONSIDERATIONS

3.1 Conservation Issues in the NNT-NBCA

The initial focus will be on the NNT- NBCA but expansion to cover the greater area of the NNT Conservation Area must soon follow. The POE sees three important issues for immediate attention. None of these are cause for delay in the appraisal and approval process by the World Bank.

3.1.1 Control of Hunting and Commercial Collection of Forest Products

The inhabitants of the NNT-NBCA hunt wildlife and collect non-timber forest products as part of their livelihood. In addition to what is eaten or otherwise used domestically, these are sold largely to traders from a neighboring country. Since 1996 the inhabitants have lost most of their rice to a plague of rats and mice which is likely to continue through 1998. (See Annex 4 for an analysis). They have had to raise cash to buy rice by even greater hunting and gathering of non timber forest products. The foreign traders also themselves catch wild animals and collect other forest products. This commercial hunting must be stopped as it is endangering the survival of wild animals whose occurrence is a principal reason for the NNT-NBCA.

The POE congratulates GOL on the success of its program to collect guns and encourages continuation of this until no more remain. Already birds and mammals have in some places been noticed to increase.

3.1.2. Zoning

There is need to zone the NNT-NBCA to demarcate clearly the areas where different types of land use may be carried out. Firstly, and most urgently, agriculture should be confined within its present boundaries and no more primary forest should be cut. Much of the existing swidden agriculture is on fairly gentle slopes within the valleys of the main rivers. If agriculture extends beyond those areas presently affected, steep hilly country will increasingly be used which are more prone to erosion. To avoid the need for this, it is planned to increase the intensity of agriculture, initially based on demonstrations at the Nakai plateau experimental farm at Theun Douane. This intensification will mean better use is made of the land and will remove the necessity to extend the agricultural area.

Secondly, zonation of other types of forest-use zones is needed. Areas should be demarcated, by agreement with the people, for example for collection of non-timber forest products, hunting to provide meat for home use, inviolate areas for conservation, and for scientific research and (eventually) for ecotourism.

3.1.3 Extension of NNT-NBCA to create the NNT Conservation Area

Steps should be taken to give legal status to (a) the northern extension, (b) the corridor to the Khoummaone Limestone NBCA, and (c) the southern corridor across Route

12 to the adjacent Hin Namno NBCA. More detail on (c) is given in Annex 5. The Khoummaone Limestone corridor (b) contains the dam and we strongly commend GOL for deciding not to build the construction camp at the dam site within the area to be protected but instead to bring in workers daily by bus. We repeat the opinion expressed in our second report that trans-frontier highways Routes 8B and 12 can cross conservation areas without reducing their effectiveness.

3.1.4 Location of the Southern Boundary of the NNT-NBCA

The Panel has reconsidered the question of the location of the southern boundary of the NNT-NBCA in the light of the various proposals and suggestions which have been made. While the final decision should be made on the basis of the overall management plans, the Panel believes that one workable solution would be to have the southern boundary at the water level of the northern edge of the reservoir. The boundary then would vary as the water level rises and falls. As we have recommended previously, the reservoir itself will need careful management for its multiple purposes.

3.2 Project-Affected People on the Nakai Plateau and Within the NNT-NBCA

3.2.1 Nakai Plateau-NNT-NBCA linkages

3.2.1.1 Planning and Implementation

In terms of planning and implementation, the POE believes that it is essential that institutional responsibilities and development strategies for future resettlers on the Nakai Plateau and inholders in the NNT-NBCA be closely integrated. In both areas, the goal is the same: to help project-affected people to become beneficiaries in ways that are environmentally, economically, institutionally and culturally sustainable. In both areas the planning process is well underway. What is necessary now, in addition to institutional strengthening at all levels, is to move from planning and consultation to the active participation of affected communities in the development and community stabilization process.

3.2.1.2 Experimental Farms/Community Development Centers

In the NNT-NBCA, the POE supports the tentative decision to create the first community development center in Thaphaiban on the upper Nam Theun, and recommends that the activities of that center be carefully coordinated with those of the two Nakai farms. While all such centers must reflect the specific needs of communities in their surrounding area, they must also focus their attention on community stabilization.

3.2.2 Community Stabilization

Community stabilization will require the achievement of two important goals. The first involves stabilizing utilization of environmental resources through an intensification of land use with special emphasis on gravity irrigation. The second involves family planning. Achieving both goals will require not only the training of

community-selected members from each village, and the active involvement of such organizations as the Lao Women's Union, but also the placement of extension personnel for extended time periods in those villages.

3.2.3 Increasing Community Participation

Active participation is the wish of project-affected people in both areas. In the NNT-NBCA, for example, in village after village community members told the POE of their desire for increased dry season rice irrigation. The most densely populated area within the NNT-NBCA is the Thaphaiban area on the Nam Theun just upstream from the dividing hills. The headman from Ban Makfeuung village informed the POE that the most important single development need would be to make the Nam Theun navigable down to the Nakai Plateau. The POE was shown that navigability could be achieved by a slight widening and deepening of the channel through one relatively short stretch of rapids. Not only is that proposal feasible but it makes more sense than a previous POE suggestion that improved access from the future reservoir be provided by the construction of roadways through the dividing hills. The proposal also illustrates the type of major benefits that can be achieved by the active participation of affected people in the planning process.

Active participation has begun to a minor extent on the two Nakai farms. While three families have been incorporated within the activities of the Theun Douane farm, the POE endorses the recommendation of the farm developers that their number be increased to ten as soon as possible. Of the various reasons supporting such a recommendation, one is for those involved to simulate a demonstration village, while another is to provide the necessary increased security. As for the second Nakai farm, the POE commends the active involvement of school children in making their own farms and recommends that such training activities be further increased during 1998.

3.2.4 Communications

At present the NNT-NBCA access road from Laksao stops at Ban Navang. The POE recommends that it is not extended beyond that point. Rather access up the Nam Theun should be provided by improving river navigation as previously described. Access to the most densely populated portion of the Nam Noy basin can then be provided by constructing a track eastward from near Ban Makfeuung across the low, intervening pass for animal carts and two wheel tractors.

3.2.5 Use of the RAP to Encourage Movement of Population Out of the NNT-NBCA

While people are constantly visiting and moving back and forth between the Nakai Plateau and the NNT-NBCA, there is a trend for individuals and households to move to the plateau. A significant proportion of the population of Ban Ka-Oy, for example, came from Thaphaiban. An increase in such voluntary movements will help stabilize or reduce population within the NNT-NBCA. Currently the RAP has identified over 20 potential village sites around the southern portion of the reservoir, current plans being to develop 14 of them for the reservoir resettler population. The

POE anticipates that the successful development of those sites will lead to further immigration of households from the NNT-NBCA. Not only should such movement be anticipated but it should also be encouraged in implementing development strategies. Placement of a school in Ban Ka-Oy, for example, could well induce additional families to move into that village.

3.2.6 Ban Ka-Oy as a Frontier Community

Located at the base of the dividing hills near the confluence of the Nam Theun and Nam Noy, Ban Ka-Oy has potential as a frontier community at the northeastern end of the reservoir. Though the villagers have yet to decide whether or not they wish to remain at their present site, the POE was favorably impressed with the potential of the area for buffalo raising, fishing and forest management as well as the people's expressed interest in participating in a program of community natural resource management.

3.2.7 Initial Limitation of Benefits to Project-Affected People

The international experience with hydro projects is that economic benefits are often captured by immigrants with more experience and capital than local people. For that reason it is important to restrict immigrant access to such benefits until after project-affected people have had an opportunity to exploit them. Access to the reservoir fishery is one example; indeed during a POE visit to fishing communities in the Nam Ngum reservoir basin, some fisher folk there were already anticipating a future move to the NT2 reservoir. Spontaneous settlement around the two Nakai farms and within resettlement and NNT-NBCA communities should also be restricted to project-affected people. It is important for project authorities to work closely with Nakai District officials to develop and enforce the necessary policies.

3.3 Effect of Reduced Discharge Below the NT2 Dam

At present it is proposed to reduce the discharge to 2 cms (cubic meters/second) which may either be continuous or pulsed, plus spillway discharges which are to be expected in the wet season. The figure of 2cms may be revised.

The POE traversed the entire 12km distance along the Nam Theun from the dam site down to the confluence with the Nam Phao. The first 9 km run through alternating rocky and sandy river banks and have some islands. For the last 3 km (except the ultimate 200m) the Nam Theun runs in a rocky ravine with boulder-strewn sides very difficult to walk along. No one lives along these 12 km, but km 0-9 had eight temporary fishing camps and a riverside path. Km10-12 had no path and fishing is probably impossible. The people from the village just above the dam site fish down about 1 km to the second rapids, the rest is fished by Hmong who walk southwards from their recently established three villages several hours distant.

Along km 0-9 the rocky ridges carry a good quality primary evergreen forest with the biggest trees 30m tall, 1m diameter. Between these ridges lie flat alluvial shelves mostly

c. 25m above January river level and carrying a low 12m tall forest containing abundant bamboo (mainly maikasart cf. Bambusa arundinacea var. spinosa) with small trees and shrubs (it is possible this forest is old agricultural bush fallow). The same bamboo is common along the forest edge. There is another less common and larger bamboo (maisot, cf. Oxytenanthera parvifolia) which has recently fruited and is dead. There is no distinctive riparian forest except the bamboo. Below it is a patchy vegetation of a mixture of several grasses, a sedge and several broadleaf herb species (viz forbs), probably confined to clay-rich alluvium (these grasses and forbs may come to colonize the reservoir drawdown zone; they were also seen along the Nam Theun within the NBCA). On rocks near the river are abundant river-resistant shrubs with willowlike leaves (known as rheophytes) of which the wide-ranging species Homonoia riparia is by far the commonest. The rocky ravine has rheophytes, bamboo fringe and rocky ridge forest.

The flow of the Nam Theun will be substantially reduced. The POE judges that this will have little or no effect on the forest. Riverbed vegetation is likely to be strongly affected but throughout the world riverine species are widely distributed (due to their ease of dispersal) and loss of them from 12 km is, we judge, an acceptable trade off for all the positive gains of the overall project. Aquatic animals including fish are likely to be seriously impacted by the reduced and altered flow. One undescribed new fish species has recently been found on this stretch of river but so far nowhere else. We judge that if indeed this fish occurs nowhere else (and several other likely rivers have yet to be explored) its loss is also an acceptable trade off.

The POE notes that the next round of reports due to be published mid 1998 will be analyzing and discussing the reduced and altered flow and its consequences.

3.4 Effect of Increased Discharge on the Xe Bang Fai Area

Much of the water which presently flows down the Nam Theun (which changes its name to the Nam Kading prior to discharging into the Mekong) will be diverted through the powerhouse into the Xe Bang Fai river basin (see diagrams in Annex 6). In the dry season this will have the effect of raising the water level 3.3 meters in the upstream area near the point of discharge into the river and 2.6 meters much further downstream at the Route 13 bridge. The river course is quite deep within the river banks in the upper reaches, and even lower down it appears to the Panel that the increased dry season depth of water will be maintained within the existing river banks (i.e., will not escape and cause flooding). The existing annual flood waters of the Xe Bang Fai fill and often overflow the banks of the river, consequently, the potential for increased bank erosion from the NT2 increases in dry season flows appeared minimal. The impact on dry season cultivation of river banks also appeared minimal, since there is relatively little dry season bank cultivation or grazing along the whole length of the river, and where it does exist it appeared that it could simply be moved two or three meters higher on the existing banks.

However, dry season irrigation for a second rice crop is being initiated by farmers throughout the whole length of the Xe Bang Fai, primarily using both electric and diesel-powered pumps. Consequently, the Panel notes that the raised dry season water level

should reduce the height the irrigation water must be raised and therefore reduce pumping costs. Electrification of all pumps should take place as soon as possible because electricity is cheaper and more efficient.

In the wet season the addition of the project water will represent a much smaller percentage of the total flood flow of the Xe Bang Fai. The additional water will have the effect of increasing the water level by 43 cm. over the present wet-season level of the one-in-five-years flood near the point of discharge (see Annex 5). At the Route 13 bridge the increase in water level would be 14 cm. In both cases the present flood stage water level is above the existing banks, so the effect of the increased water from the project will be to slightly increase the amount of the existing flooding.

On the other hand the effect of the project would be to reduce the level of the Mekong River at the Xe Bang Fai confluence. The reason is that at present the Nam Theun/Nam Kading discharges its flow into the Mekong many km. upstream of the Xe Bang Fai confluence. NTEC has calculated that if the reservoir is managed to trap the Nam Theun flow, there will be a reduction in the Mekong flood level at the Xe Bang Fai confluence of 16 cm. This may have the effect of reducing the severity of present flooding in the area between the Route 13 bridge and the Mekong, because that flooding apparently is caused both by Xe Bang Fai flow backing up against the Mekong flood waters (which have been augmented upstream by the flood waters from the Nam Theun/Nam Kading), and those Mekong flood waters outflowing into the Xe Bang Fai flood area. Improved management of the flood waters is still needed, but the impact of the additional water from the project would appear to be minimal, and there may be benefits such as the reduced dry season pumping costs.

The Panel did not have the information to assess the impact of the increased flows on the Xe Bang Fai fish fauna. Because the addition of project water will represent a small percentage increase in the wet season flows, it appears unlikely that there would be much impact on fish fauna at that season. In due course it will be necessary to investigate the effect of increased dry season water.

4. CONTINUING ACTIVITIES OF THE PANEL

During the remainder of 1998 the Panel anticipates or is available for the following activities:

1. Desk review of revised studies and plans as advised by fax of 10 December 1997 from Khamleuang Sayarath, and included in the January 1998 TOR.
2. Lee Talbot to consult with World Bank, Government officials, and NGOs in Washington.
3. One or more of the Panel members would be available to return to Laos if requested to do so by the GOL (for example, in connection with the proposed public consultations in the NBCA).

4. Next regular visit to of the Panel to Lao P.D.R. is proposed for the same time next year.

5. ANNEXES

Annex 1
Itinerary of the Third Mission of the POE

Actual Overall Itinerary

Mission III of the POE, January 1998

Day 0	Friday, Jan.2. 1998		POE members arrive Vientiane
Day 1	Saturday, Jan. 3.1998		Briefing POE on downstream power house and dam impacts/Peter Goldston in Vientiane
		12.30 pm	Depart to Thakhek and Overnight Thakhek
Day 2	Sunday, Jan.4.1998	7.30 am	Depart by road from Thakhek to Nakiao (Namphit junction with Xe Bang Fai. where waterway will discharge into XBF.)
		10.00 am	Depart from Nakiao to Ban Thakho by rubber boat stopping at villages en route <ul style="list-style-type: none">• B. Dang• B. Phanang
		18.00 pm	Arrive Ban Thakho (Robert Goodland joins group at about 18.30 hrs at B. Thakho) O/night Ban Thakho.
Day 3	Monday, Jan.5.1998	7.30 am	Depart by car to B. Som
		9.00 am	Depart from Thakho to Bridge 13 by boat stopping at villages en route <ul style="list-style-type: none">• B. Thahat• B. Se Noy
		18.00 pm	Depart Bridge 13 for Thakhek by car O/night Thakhek
Day 4	Tuesday, Jan. 6.1998	7.00 am	Depart Thakhek for Bridge 13 by car
		8.00 am	Depart Bridge 13 by boat and proceed to junction of XBF and Mekong stopping at villages en route <ul style="list-style-type: none">• B. Gnangkham• B. Hatkhamhiang• B. Dongsangan
		18.00 pm	Return to Thakhek by road stopping at B. Donkhlae. O/night Thakhek
Day 5	Wednesday, Jan. 7.1998	07.00 am	Depart Thakhek by road for Vietnam Border via Route

12 (Southern Escarpment)

20.00 pm Return to Thakhek

Overnight Thakhek

Day 6 Thursday, Jan. 8.1998 7.15 am Depart Thakhek to B. Thalang (B. Signo) via Lak Sao by car.

13.00 pm Depart B. Thalang for Dam Site by Rubber Boat.

17.30 pm Arrive Dam Site

Overnight Dam Site

Day 7 Friday, Jan.9.1998 08.00 am Depart Dam Site

12.30 pm Arrive Lunch Site, by boat
(9 km D/S of dam site.)

13.30 pm Walk from lunch site to Nam Phao junction camp site

20.00 pm Arrive Camp Site

Overnight Nam Phao junction

Day 8 Saturday, Jan.10, 1998 10.00 am Depart from Junction by Helicopter (which has flown in from Lak Sao after flight from Vientiane)

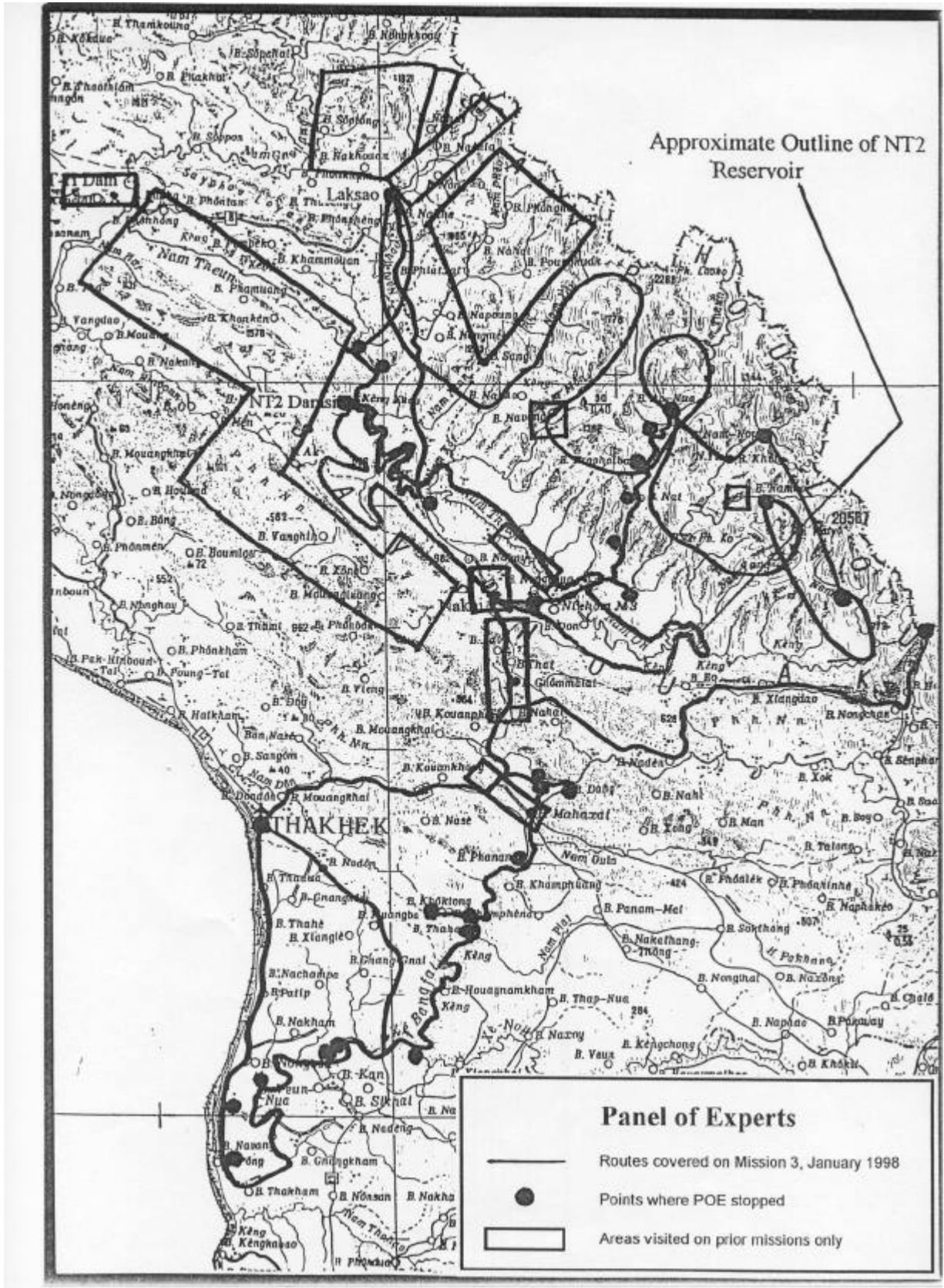
Lak Sao and refuel.

Overfly

- Lower Nam Sot
- Upper Nam Sot
- Upper Nam Mon
- Lower Nam Mon
- Lower Nam Theun
- Upper Nam Theun
- B. Vangchang (LAND. unload boats & camping equipment)
- Down Nam Theun
- Lower Nam Yang
- Ban Nameo (LAND)
- Lower Nam On
- Forest landing spot (LAND)
- Ban Maka Neua (LAND)
- Upper Nam Noy
- Ban Theung
- Ban Vangchang (LAND. POE leaves helicopter)

		15.15 pm	Arrive Ban Vangchang
			Overnight Ban Vangchang
Day 9	Sunday, Jan. 11.1998	7.00 am	Depart from Vangchang by rubber boat on Nam Theun to B. Kobong stopping at villages en route <ul style="list-style-type: none"> • B. Xoklek
			O/night Ban Kobong
Day 10	Monday, Jan. 12.1998	7.00 am	Depart from Ban Kobong by boat to Tam Meo Rapids Stopping at villages en route <ul style="list-style-type: none"> • B. Makfeuung
			O/night Tam Meo Rapid Cam Site.
Day 11	Tuesday, Jan. 13.1998	7.00 am	Depart from Tam Meo Rapid to Sop On by boat stopping at B. Ka-Oy en route
		12.00 am	Inspect Theun Douane Farm.
			Leave for Thakhek.
			O/night Thakhek
Day 12	Wednesday, Jan. 14.1998	05.00 am	Depart from Thakhek for Vientiane
		08.30 am	Arrive Vientiane
			POE in Vientiane - consultations and report writing.
Day 13	Thursday, Jan. 15.1998		POE in Vientiane - consultations & report writing <ul style="list-style-type: none"> • Meetings <ul style="list-style-type: none"> • H.E. Wendy Chamberlin • H.E Soulivong Daravong • Dr Souli Nanthavong
Day 14	Friday, Jan. 16.1998		POE in Vientiane - consultations & report writing
Day 15	Saturday, Jan. 17.1998		Draft Report handed over to GoL <ul style="list-style-type: none"> • H.E. Khammone Phonekeo • Mr Noulinh Sinbandhit
			Lee Talbot and Robert Goodland depart Vientiane.
Day 18	Wednesday, Jan.21.1998		<ul style="list-style-type: none"> • Final Report to GoL • Ted Scudder and Tim Whitmore depart Vientiane

Annex 2
Map of the Areas Visited by the Three Missions of the PO



Annex 3
Map of General Area

Annex 4

Rodent Plagues

Villagers in the NNT-NBCA have for the last few years lost most of their rice to a plague of rats and mice. We believe that this plague has followed the fruiting (and subsequent death) of the widespread and common bamboo maisot (cf. Oxytenanthera parvifolia) which produced a huge crop of grain. Rodent numbers increased on this and they have moved on to eat rice. This is well known by the villagers who anticipate a subsequent fall off in the rodent population. They sum up this phenomenon in the aphorism:

mai phai tang khi, keut nou

(when the bamboo falls, mice rise)

Such gregarious fruiting of bamboos occurs throughout seasonal tropical Asia at intervals of perhaps one human life span.

Annex 5
Observations on Route 12
and the Corridor Linking NNT-NBCA and the Hin Namnu NBCA

Route 12 runs from Thakhek to Vietnam, just south of Gnommalat. It skirts the high escarpment that delimits the eastern end of the Nakai Plateau and NNT-NBCA. The POE traveled up to the Vietnam frontier beyond which lies a paved highway. Within Lao Route 12 is due to be upgraded by 2000. The upper end has no villages, apparently because there is no permanent water.

The roadside forests are low in stature and consist of small trees and shrubs. The Ho Chi Minh trail ran up Route 12 and these forests were very heavily bombed and burned with napalm. The ground is pock-marked by almost continuous bomb craters. It is surprising that there has been such poor recovery of the forests even now 24 years after bombing ceased. Near the frontier are several grassy hills, apparently the consequence of a land battle, and presumably maintained free of trees by burning.

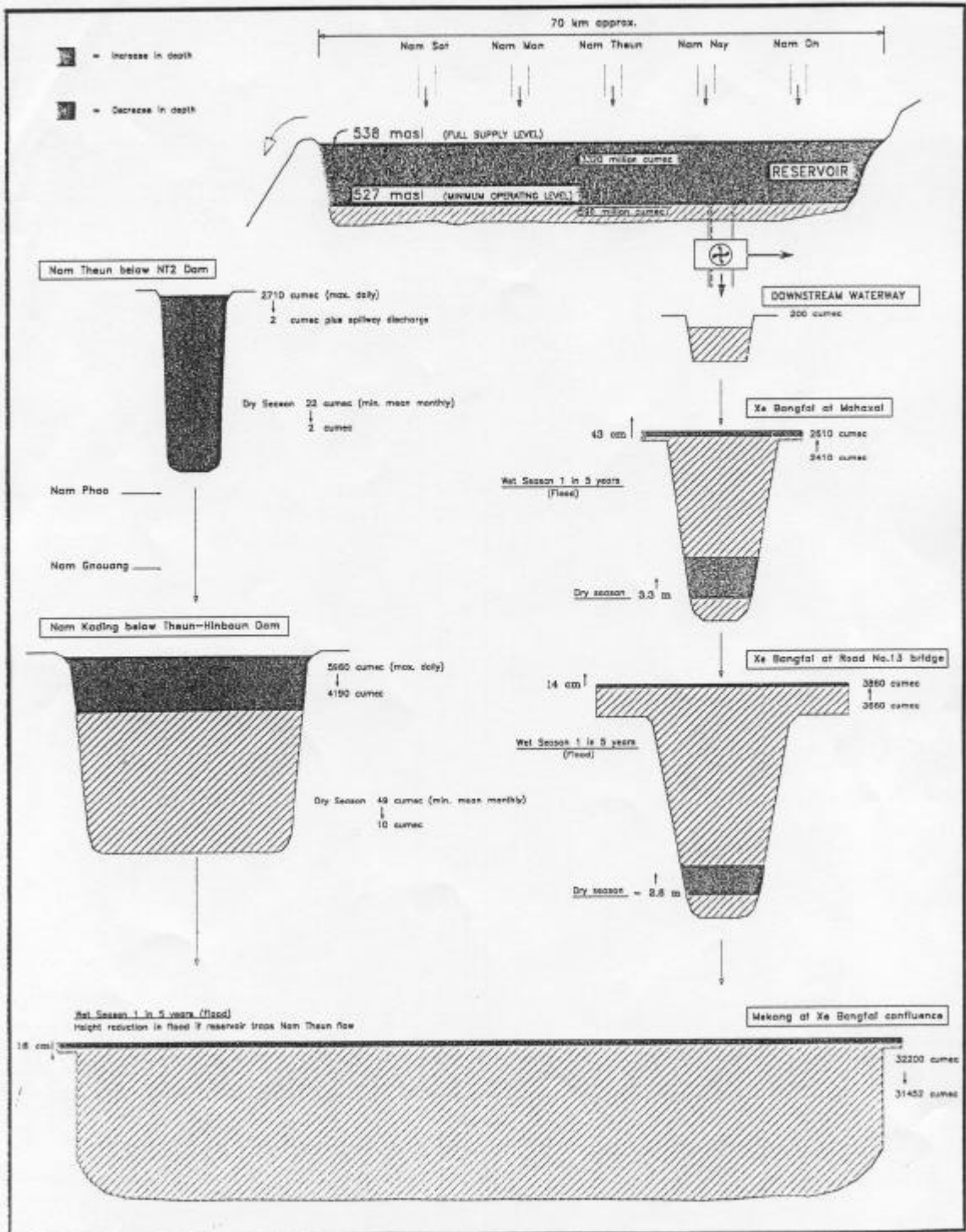
Guns were collected in late 1996 and the frontier officer reported much more abundant birds and mammals since then.

The NNT-NBCA scarp to the west is mostly forested and considered passable even to elephant (R.Robichaux,pers.comm.). There is a narrow belt of only 1-2 km between NNT-NBCA and the Hin Namno NBCA to the east. Animals can cross this, but are unlikely to venture onto the grass.

The POE recommends early creation of a corridor of conserved forest joining these two NBCAs from the frontier for several km south to near the first village. The corridor should be crossed by an excluded belt, up to say 60 m wide, for the highway. No buildings should be allowed except on the grassy areas which are suitable also for perhaps a market. These measures will have the effect of uniting the two NBCAs without blocking the frontier and should be enacted before the highway is upgraded and human pressure increases.

Annex 6
Diagrams of Water Transfers of the NT2 Project

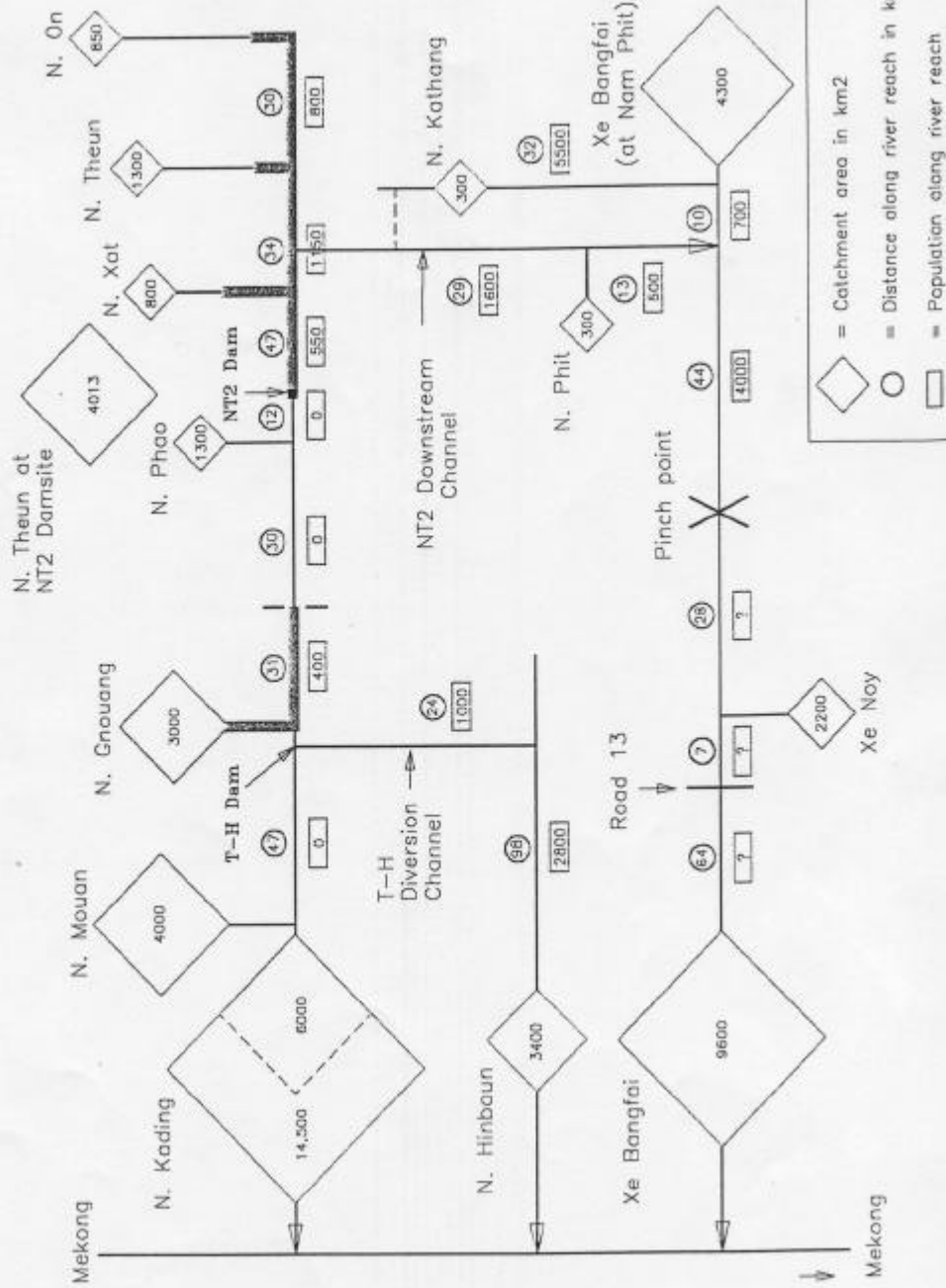
WATER TRANSFERS FROM NAM KADING TO XE BANGFAI



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13/JAR/1997

SCHEMATIC DIAGRAM OF RIVERS RELEVANT TO THEUN-HINBOUN (T-H) AND NT2 DAM PROJECTS (Not to scale)



29/MAY/1987

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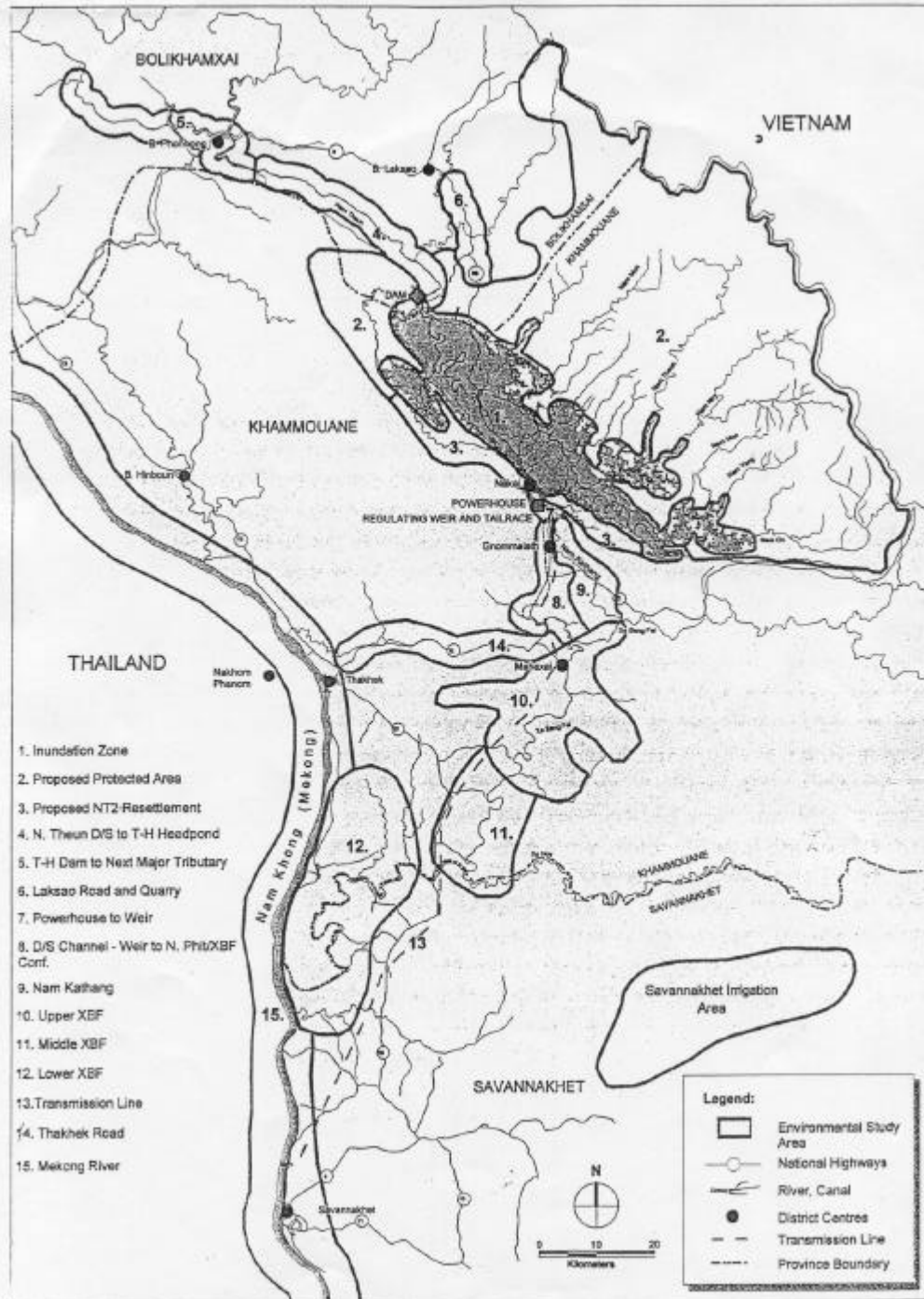


FIGURE ES-1 ENVIRONMENTAL STUDY AREA ZONE MAP