

Ruined rivers, damaged lives



The Impacts of the Theun-Hinboun Hydropower Project
on Downstream Communities in Lao PDR

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Cover photo: Woman washing on the Nam Hinboun.

The Association for International Water Studies (FIVAS) monitors the role of Norwegian aid and Norwegian companies in the water sector in developing countries. FIVAS seeks to prevent Norwegian support for policies and projects with significant environmental and social impacts and contribute to improved decision-making processes.

FIVAS

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Abbreviations

ADB	Asian Development Bank
DAFO	District Agriculture and Forestry Office
EdL	Electricité du Laos
EIA	Environmental Impact Assessment
EGAT	Electricity Generating Authority of Thailand
EMCO	Environmental Management Committee Office
EMD	Environmental Management Division
FIVAS	Association for International Water Studies
IRN	International Rivers Network
Lao PDR	Lao People's Democratic Republic
MCP	Mitigation and Compensation Programme
NOK	Norwegian Krone
NORAD	Norwegian Agency for Development Cooperation
NTPP's	Non-timber forest products
RMR	Resource Management and Research
THPC	Theun-Hinboun Power Company
THHP	Theun-Hinboun Hydropower Project
THXP	Theun-Hinboun Expansion Project
TOR	Terms of Reference

Author's notes

- Names of villagers used in the text have been changed to protect their identity
- Where Lao names are used, the word is written as the nearest transliteration according to the author's hearing of the word, rather than any standard usage.

Glossary of Lao terms

<i>goong</i>	freshwater shrimp or prawn
<i>hai</i>	upland rice fields
<i>hoi</i>	shellfish
<i>lao khao</i>	rice storage barn, commonly found next to house in lowland Lao villages
<i>khao</i>	means both rice and food
<i>naa</i>	paddy field/s
<i>naa bee</i>	wet season rice crop
<i>naa saeng</i>	dry season rice crop
<i>naa sak</i>	a labour-intensive rice cultivation technique, whereby rice seeds are planted in individual holes dug for the purpose
<i>ngeuak</i>	a mythical, serpent-like creature, believed to haunt rivers and lakes and snatch unwary victims to their death
<i>paa lao</i>	forest classification term, meaning degraded forest
<i>pba</i>	fish
<i>pba daek</i>	salted, fermented fish; commonly eaten as an accompaniment to many Lao dishes
<i>rai</i>	a unit or area equivalent to 1,600 m ²
<i>tao</i>	an edible filamentous algae attached to rocks in streams and rivers
<i>tiang naa</i>	hut found in rice fields used for resting and eating by owner
<i>suan</i>	a vegetable garden or fruit orchard
<i>wah</i>	unit of length, approximating to two metres
<i>wang</i>	fish conservation pool, found in river or stream
<i>sanguana</i>	

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Executive Summary

The Theun-Hinboun Hydropower Project (THHP) in central Lao PDR has been generating electricity for almost a decade, 95 % of which is exported across the Mekong to neighbouring Thailand. Owned and operated by a consortium of public and private interests from Lao PDR, Thailand and Norway, and funded by the Asian Development Bank and Nordic Development Fund, the Theun-Hinboun Power Company (THPC) has reportedly been making healthy profits during the last nine years of operation. These profits were boosted by long delays in implementation of the Nam Theun 2 Hydropower Project, which is located upstream and will reduce water flows in the Nam Theun-Kading River when completed. While THHP was originally lauded by the ADB as a project with “little for the environmental lobby to criticise”, it has been responsible for widespread social and environmental impacts since commencing operation. THPC in its Mitigation and Compensation Programme had previously estimated that only about 3,000 families in 57 villages were affected by the entire project in the upstream, headpond and downstream areas of the Nam Hai and Nam Hinboun rivers and Theun-Kading River as far as the Mekong confluence.

In 2004, THPC announced a planned expansion of the power generating capacity of the project, through building a storage dam and reservoir on the Nam Gnouang tributary upstream of the existing headpond and releasing more water downstream in the Nam Hai and Nam Hinboun rivers. The extra releases would cause a doubling in flows downstream to 220 m³/s, in both dry and wet seasons, on a river already prone to damaging floods and suffering the impacts of the existing project releases. An environmental impact assessment (EIA) was commissioned the same year, and has since been superseded by a new EIA and Resettlement Action Plan (RAP) prepared by Norplan AS, a company with close links to THPC. On 22 October 2007, THPC held a National Workshop on the

Expansion Project in Vientiane, to which only state agencies were invited.

In order to gain an insight into the current situation on the Nam Hai and Nam Hinboun rivers, the Association for International Water Studies (FIVAS) commissioned a researcher to undertake a field survey of downstream impacted communities and ascertain the level of awareness surrounding the proposed Expansion Project. This rapid field assessment was conducted by two researchers over ten days in late May 2007, by interviewing numerous affected people in five representative villages situated between the power station and the Nam Hinboun – Mekong confluence. These village visits took place in the absence of any government officials or THPC staff. Around 29,400 people in 5,041 households of 71 villages live along the Nam Hai and Nam Hinboun rivers and have been affected to varying degrees by the project.

The following is a summary of major findings from this field visit:

- Fish and aquatic resources stocks have continued to decline since the start of THHP, causing hardship and loss of livelihood options to local people. No compensation has been paid for lost fish productivity, and small public fish ponds built in a few villages as mitigation measures have not had any measurable impact. Many formerly important aquatic organism food items such as molluscs, shrimp and edible weed have disappeared altogether from the Hinboun River, forcing villagers to turn to other protein sources such as rats and wild game to survive.
- Fluctuating water levels and stronger flows have caused serious erosion along the Nam Hai and Hinboun Rivers leading to loss of fertile agricultural land, riverbank gardens and vegetation. These losses have not been compensated and efforts by THPC to restore

riverbank gardens on higher land have met with limited success. In several villages visited, the replacement gardens have been abandoned altogether, often due to flooding which has killed fruit trees, or a lack of markets for produce.

- Flooding has become increasingly severe over the last nine years, a problem linked to THHP water releases, which have caused erosion and sedimentation in the Nam Hinboun, compromising its ability to carry floodwater. Villagers have experienced repeated loss of wet season rice crops, leading to widespread paddy field abandonment. According to one source, it has been estimated that over 820 ha of paddy has been abandoned over the past decade. Villagers report that the crucial factor killing rice plants is not only flood duration or height, but also the turbidity or suspended sediment level in the water, which has increased since the start of the THHP.
- The increased flooding has also caused water contamination and skin diseases; drinking water scarcity; death of livestock from drowning and disease; loss of stored fodder and grazing for livestock; loss of fruit and other trees and plants; temporary food shortages and loss of income; and difficulties with access and mobility for many families.
- The Company refuses to admit that its operations are causing the worsening downstream flooding despite the growing evidence, and villagers claim to have been harassed by THPC staff and government officials to refrain from speaking publicly about this issue. The Company's failure to admit liability has led to a loss of trust and good faith between the Company and affected communities.
- The additional water flows have made dry season river crossings hazardous. While some villages were promised bridges, these promises never materialized and at several locations childrens' lives are put at risk as they are obliged to paddle a small boat across fast

flowing water to get to school each day.

- The fluctuating water levels in the Nam Hai would appear to have led to the deaths of several people in recent years, including that of a young child of five, who was swept to his death while playing near the water during an unannounced shut-down and re-opening of the turbines. Villages sometimes lost boats or fishing gear due to sudden water releases, and these losses are not compensated.
- Some 18 villages along the Nam Hinboun from the Nam Hai confluence downstream to Ban Vangmon are still lacking electricity, despite the fact that many were promised power soon after the dam was complete.

THPC's Mitigation and Compensation Programme Failing

The Mitigation and Compensation Programme initiated by THPC in 2001 to address the project's social and environmental impacts has not lived up to expectations and is failing to restore people's livelihoods. Many concerns raised in the Independent Review of the Environmental Management Division conducted in March 2004 have either been ignored or not adequately dealt with. The following issues can be singled out as matters of foremost concern:

- The MCP has put undue emphasis on promoting irrigated dry season rice as the key to their livelihood replacement strategy, even though there is clear evidence of failure in many villages. The gradual failure of the dry season rice programme has led to a loss of trust between EMD/THPC and impacted villages, with both sides tending to blame the other. Many villagers are unsure if they can afford to carry on and irrigation infrastructure is starting to be abandoned through lack of new investment. A lack of close and dedicated extension support is one clear reason for failure.

- Many households complained that the costs of participation in some MCP activities, including dry season rice and livestock raising, are too high, and when crops have failed they are plunged into debt. This especially applies to the poorest families in the village, who are least likely to participate in activities which involve risk.
- In many villages replacement riverbank gardens have been abandoned, either by all or some of the participants. The reasons for this are complex, but stem from technical difficulties like pump failure, infertile soil, livestock damage and pest damage; to the lack of a guaranteed market for produce and inconvenience of access for some gardens which are far from the village. Several gardens have been abandoned because of successive flood damage which the villagers blame on THPC. A key factor has been poor and irregular extension support to the villages in latter years.
- The livestock programme seems to have more or less ground to a halt, with few villagers involved now compared to a few years ago. Introduced animal breeds such as pigs and chickens did not thrive and have mostly been sold off or died from disease, while gains from the vaccination programme may be wiped out by direct losses from exacerbated flooding.
- Despite clear recommendations in the 2004 EMD Review to devote personnel and financial resources to aquatic resources research, education, conservation and small-scale aquaculture, there is no evidence that this has been implemented. As a result, the aquatic resource base has continued to degrade and villagers complain about hardship from scarcity of previously abundant food items, including fish, molluscs, crustacean and amphibians, while no viable alternative strategy has been developed to replace wild resources with cultured fish.

The households least likely to be participating in the

EMD program and with the highest chance of falling in debt and dropping out are those most vulnerable to rice shortages caused by project-aggravated flooding and declines in fish and aquatic resource productivity. Hence, these poorest households in the village are being punished twice. Their plight is being exacerbated by other state-supported developments occurring in the locality, in particular the Japanese company Oji's eucalyptus plantations, which are destroying upland forests, which formerly provided upland rice swidden and non timber forest products for vulnerable families. Food security is becoming a serious issue for thousands of households, who were formerly rice self-sufficient even without the proposed Theun-Hinboun Expansion Project (THXP).

The Expansion Project: The Worst is Yet to Come

The Theun-Hinboun Expansion Project is scheduled for construction from 2008-2011 and would effectively double flows through the turbines for much of the year. As well as increasing flows down the Nam Hai and Nam Hinboun rivers to the Mekong, affecting over 5,000 households, the extra erosion, sedimentation and aggravated flooding could be disastrous and require massive resettlement.

The proposed Expansion Project poses numerous serious risks to the livelihoods and well-being of the downstream communities, which are already suffering uncompensated losses caused by the existing THHP. People have not been adequately informed or consulted about the changes that would result from the extra water flows down the river, and many are living in fear of village resettlement, where the terms and conditions are still uncertain. While THPC claims that the resettlement would be voluntary, the reality is that the villagers will have little choice in the matter.

Given the unresolved impacts of the existing project and uncompensated losses for affected persons in all of the THHP impact areas, it would seem to be highly irresponsible to be considering compounding these impacts with a larger project which would actually increase flows into the Nam Hai and Hinboun rivers. THPC should suspend plans to implement the THXP until full and satisfactory compensation for existing losses has been paid to all affected people and adequate measures are put in place to address the ongoing social and environmental impacts in the downstream areas. Where inadequate baselines exist due to THPC-fault, then the benefit of the doubt should be given to the villagers and independent experts consulted.

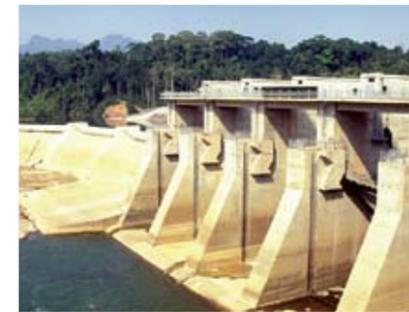
While THPC and its overseas shareholders (including Norwegian-based investors) have been enjoying "windfall profits" as a result of delays to the larger upstream Nam Theun 2 Project, it has been some of the poorest people in SE Asia with few coping mechanisms that have been forced to bear the true costs of the Theun-Hinboun Hydropower Project. Lao PDR's growing predilection for large trans-basin diversion projects, potentially affecting not just Laotian rivers but the internationally shared Mekong River too, is essentially a journey into the unknown, which could have grave consequences for the region well into the future.

«Since rice is synonymous with food (khao means food and rice) all other resources are utilized in order to acquire enough before anything else is purchased. **There is no substitute for rice.** It is absolutely essential to understand this point if development in the region is to benefit the villagers directly»

Sparkes, 1995. NB. Bold emphasis that of original author

Theun-Hinboun Hydropower Project

Introduction and short history



Theun-Hinboun dam, Ban Xang villagers discuss project impacts, girl fishing with lift net.

The Theun-Hinboun Hydropower Project, a 210 MW trans-basin diversion project, straddles the provinces of Bolikhamxai and Khammouan in central Lao PDR. It was officially opened on April 4, 1998 and diverts water out of the Nam Theun-Kading³ River into the much smaller Nam Hai and Hinboun River Basin, which empties into the Mekong River, some 115 kms downstream from the power station. The Nam Theun-Kading River is blocked by a 25 metre high concrete dam, mistakenly described in project literature as “run-of-river weir”⁴, which diverts water down a steep escarpment into the powerhouse. Ninety-five percent of the energy generated is sold to the Electricity Generating Authority of Thailand (EGAT).

The Theun-Hinboun Hydropower Project (henceforth referred to as THHP) is a BOOT (Build-Own-Operate-Transfer) scheme which is owned and operated by the Theun-Hinboun Power Company (THPC) under a 30 year license. THPC is jointly owned by the state utility Electricité du Laos (EdL) (60 %); GMS Power Company of Thailand (formerly MDX) (20 %), and Nordic Hydropower AB (20 %), itself owned by the Norwegian power utility Statkraft⁵. The Asian Development Bank (ADB) loaned \$60 million out of a total cost of \$260 million to the Lao Government for its equity share of the project and the Nordic Development Fund loaned another \$7.3 million (IRN, 1999). The Swedish and Norwegian governments provided some \$70 million in government guaranteed loans for the project from Nordic financing institutions (Pahlman,

2000). According to a FIVAS (1996) report, the Norwegian Agency for Development Cooperation (NORAD) financed the THHP’s feasibility study (10.1 million NOK), Final Design (35 million NOK) and supplementary environmental studies (6.5 million NOK). Nordic Hydropower supervised the dam’s construction and won the contract for operation and maintenance (Ryder, 1999). Norwegian and Swedish companies supplied the electrical and mechanical equipment with financing from Nordic export credit agencies and the multilateral Nordic Investment Bank.

From the start, FIVAS recognized that the THHP carried high risks to downstream communities and riverine ecology on two river systems. These concerns were passed on to NORAD in a report titled *More water, more fish? A report on Norwegian involvement in the Theun-Hinboun Hydropower Project in Lao PDR* (FIVAS, 1996). This report highlighted the lack of consultation with affected villagers prior to project construction and the failure to inform villagers of potential negative impacts, in contravention of NORAD and ADB’s lending guidelines. Yet for several years after, the THHP was being described as a “win-win” project by ADB and other project proponents, supposedly due to fact that large-scale flooding of land or resettlement was not required (Ryder, 1999). An ADB spokesman went so far as to proclaim the project “a winner”, with “little for the environmental lobby to criticize” (Gill, 1997).

Despite the exuberance of the dam’s proponents about

minimal social and environmental impacts, reports by researchers on the ground were proving otherwise. In April 1998, International Rivers Network (IRN) released a report by Bruce Shoemaker, titled *Trouble on the Theun-Hinboun*, which found many serious impacts soon after project commissioning. Interviewing people in ten villages in three distinct affected areas, the report found that the THHP had reduced fish catches by 30 – 90 %; caused loss of riverbank vegetable gardens; loss of dry season drinking water sources, and caused transportation difficulties. In addition, some villagers had had to relocate their homes due to flooding, and had not received adequate assistance with the process (Shoemaker, 1998). It found the project impacted area to be much wider than had been originally considered in the EIA studies, and people in many villages downstream along the Nam Hinboun to the Mekong confluence were suffering ill effects from the project. While the ADB and THPC’s initial reaction was to discredit the IRN report, in late 1998 the ADB released an Aide Memoire that acknowledged all of the impacts identified by Shoemaker and that THPC had agreed to redefine the project impact zone to include the Nam Theun-Kading downstream of the dam to the Mekong confluence, and along the Nam Hai and Nam Hinboun downstream until the Mekong confluence (IRN, 1999).

The original Environmental Management Committee Office (EMCO) established by THPC was rapidly viewed as redundant with a grossly inadequate budget and capacity to cope with the scale and magnitude of impacts (Ryder, 1999; IRN, 1999). After widespread criticism from civil society and recommendations from the ADB, in 2000 the THPC hired a UK-based consultancy company Resource Management and Research – RMR to produce a 10-year

Mitigation and Compensation Programme⁶ (MCP) funded out of project revenue. The MCP recommended the formation of an Environmental Management Division (EMD) with a budget of \$4.5 million over a decade. The MCP (RMR, 2000) identified the following as the major impacts from the THHP:

- Loss of dry season riverbank gardens, which were an important source of food and income
- Loss of access to traditional fishing and fish breeding areas, which are an important protein source for villagers.
- Erosion along sections of the Hai and Hinboun Rivers, which caused loss of land and access to clean water supplies.
- Losses of income by villagers due to delays by the company in taking action to solve the problems caused by the project.

The initial MCP Logframe⁷ covered the period from 2001 – 2006 and was designed to address the more immediate and urgent socio-economic and bio-physical impacts arising from the project’s operations. It identified 57 villages containing approximately 3,000 households as being directly impacted and eligible for assistance from EMD. One of the provisos of the MCP, and in-line with ADB best-practice guidelines, was a biannual “Independent Review” of the project by external consultants, originally scheduled for mid-2003, but later postponed to the first quarter of 2004. The Review panel consisted of experts not directly connected with the hydropower industry or project lenders in the following three fields: Community Organization and Development; Natural Resources Management and Environment; and Fisheries.

³ The Nam Theun river which flows down from the Nakai Plateau (site of Nam Theun 2 Dam), officially becomes the Nam Kading river at the confluence of the Nam Gnouang river, which now forms part of the Theun-Hinboun dam’s headpond. In this report, to indicate that it is one and the same river, it will be referred to as the Nam Theun-Kading river and basin when talking about the river in general terms, but either Nam Theun or Nam Kading when referring to it in geographically local terms, according to local nomenclature.

⁴ The accuracy with which this term has been applied to the Theun-Hinboun Hydropower Dam has been questioned by several authors, including Pahlman (2000) and Roberts (2004). They contend that it is misleading and inaccurate when up to 92 % of one river’s flow is diverted into a separate basin, thus massively altering the natural hydrological regimes of both river systems. Pahlman (2000) poses the question “Run of which river?”, while Roberts (2004) prefers to call the Theun-Hinboun scheme a “trans-basin ruin of rivers”.

⁵ Nordic Hydropower AB was formerly jointly owned by Statkraft and Vattenfall (a Swedish power company), but in 2002 Statkraft bought out Vattenfall’s share to become the sole owner.

⁶ Available at: http://www.adb.org/Projects/TheunHinboun/logical_Framework/logical_framework_2001_2006.pdf

⁷ Unauthored document titled: “Logical Framework: 2001-2006. To implement the 10-Year Mitigation and Compensation Plan of Theun-Hinboun Power Company Limited. February 2002”



Re-regulation pond outlet at Ban Namsanam during a period of low water caused by turbine shutdown, allowing villagers to fish temporarily.

The review was completed on schedule in March 2004, but was not released by the company until a year later. The review found the EMD to be generally efficient and performing its functions well. However, the team did have concerns about issues of equity, participation and inclusion of all affected persons. Some activities were seen as having questionable sustainability and others, such as fisheries compensation measures, had yet to begin.

Since 2004, civil society has continued to monitor the project and engage with key stakeholders in expressing concerns about the ongoing impacts on impacted communities and the environment, but responses from the ADB, Nordic agencies responsible and the Lao government have been lukewarm at best and often unresponsive to requests for information. AMRC (2006) in a newsletter article, highlighted the following two areas of immediate concern:

- There is currently no external regulation of the MCP (a second Independent Review was never initiated). This implies that should the company change its attitude or policy towards supporting the Programme, it is not bound to ensure the villagers' interests are protected.
- A new Environmental Impact Assessment (EIA) was conducted between 2004 – 2006 for the Theun-Hinboun Expansion Project (THXP) which would

create additional environmental impacts and possibly exacerbate existing ones. This new project would possibly require resettlement of villagers in several impact zones, and would place significant demands on the MCP, which would thus need to be considerably expanded.

By late 2006, it was becoming apparent from various sources that there were many unresolved issues surrounding the existing project and indications that people were suffering badly due to ongoing impacts, especially in downstream areas of the Nam Hai and Hinboun River basins. These impacts have been exacerbated by other local developments, often state sanctioned such as mining and industrial tree plantations, to create multiple impacts which are driving the villagers into entrenched poverty, food insecurity and increased vulnerability. While at the same time well-meaning efforts to provide village development assistance through the EMD are not meeting their goals and often creating village divisions and conflict.

Meanwhile, THPC seems intent on proceeding with its proposed expansion project.⁸ The project would require construction of a 70 m high concrete dam with a 60 MW power station (for domestic supply) and the existing power station below the headpond would be expanded to include a new 220 MW power station. The electricity from the latter station would primarily be for export to Thailand.

⁸ Source: Water and Power Magazine, July 6, 2007. Nam Theun-Hinboun Expansion project progressing. <http://www.waterpowermagazine.com/story.asp?sectionCode=130&storyCode=2045662>

2 Background to Study and Methodology

Given the controversial history and contested nature of the impacts surrounding the THHP, there is a need for objective information sourced from impacted communities. Barney's 2007 report points to serious and on-going impacts in one village downstream of the power station, which are not being adequately addressed by the MCP activities in their present format, focus and budget levels. Barney's report raised questions about to what extent his findings were applicable to other villages living along the Nam Hai and Hinboun rivers. In addition, since the 2004 Review of the Environmental Management Division (Blake et al., 2005), there has been no subsequent independent review to examine to what degree the concerns and recommendations of the first review had been adopted and put into practice by THPC.

Furthermore, given the desire of the THPC shareholders to move forward with a new dam scheme (THXP), it is crucial that similar mistakes brought to light by NGOs and civil society in planning and implementing the first dam project are not repeated a second time, and that the true costs of the development are not externalised onto local communities and environment. More than anything, the voices of local people need to be recognised, heard and brought out to a wider audience, as experience from across the Mekong region suggests it is *they* who bear the brunt of poor development decision-making time and again, yet are rarely heard by those with the power to decide their future fates.

The objective of this study was to conduct a rapid field assessment of impacts related to the existing Theun-Hinboun Hydropower Project (THHP) on downstream communities in the Nam Hai-Hinboun River valley and to collect detailed baseline information from a set of representative households that can be monitored in the future in relation to the proposed Theun-Hinboun Expansion Project.

2.1 Methodology

Five villages in the impact zone on the Nam Hai and Nam Hinboun Rivers downstream of the THHP powerhouse were pre-selected as being broadly representative of the various river reaches and located roughly similar distances apart. These villages were visited for two days each, with the exception of Ban Tha on the Nam Hai, which was visited for only one day and one night. The villages visited, all located in Hinboun District, Khammouan Province, in order were:

- Ban Nong Boua (63 households)
- Ban Xang (43 households)
- Ban Thonglom (72 households)
- Ban Kongphat (44 households)
- Ban Tha (96 households)

In each village, key informants and local leaders were met, including the headman and, sometimes, deputy headmen. The objectives of the study were explained and cooperation sought in conducting the study. The researchers made clear that they were not from THPC and were interested in learning about natural resource changes over the last ten years, especially in relation to the river and aquatic resources. In addition to informal and casual interviews with various men and women around the village, the researchers conducted three formal semi-structured interviews in each village with three representative households. Two relatively "poor" households and one relatively "wealthy" household were chosen for this purpose, although the exact wealth definitions were left somewhat open to interpretation. The households interviewed were mostly selected by the village headman or his deputy, but in a few cases we selected them ourselves during village walks on the basis of such raw indicators as house size or level of apparent wealth. We did stipulate that households selected must have lived in the village since before the dam was constructed, which in the case of Ban Tha led to some changes to the households proposed by the headman.

« ...there has been a profound alteration in the natural flow regime of both river systems. »

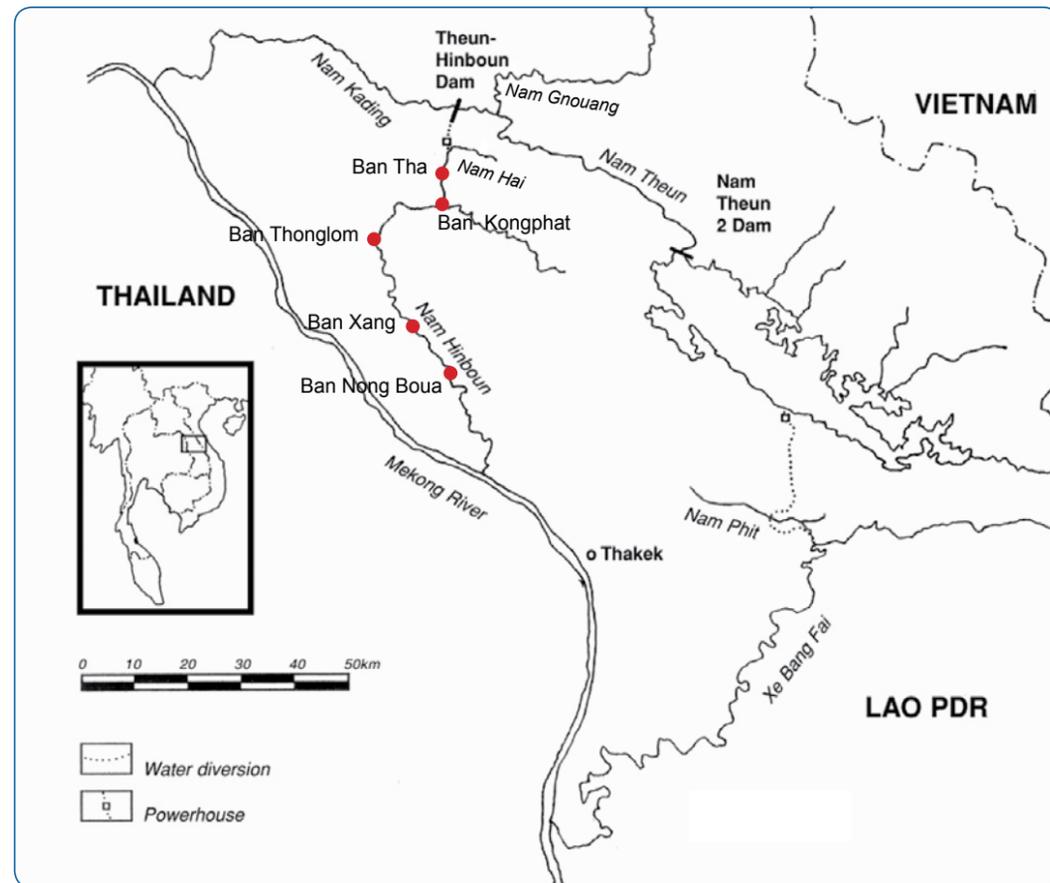


FIG 1. Location of Villages Impacted by Nam Theun-Hinboun Hydropower Project Operations

The data collected was recorded on a questionnaire form and has been filed for later reference. It included both quantitative and qualitative data, but the sample sizes are too small to be statistically significant so no attempt at analysis has been made. The information gathered is more an indicative guide to present socio-economic status and livelihood patterns, which can be triangulated against other data gathered, both primary and secondary, to confirm or discount apparent trends and issues raised. It can also be used to compare individual household's present approximate socio-economic status against some future point in time. It should be mentioned that in a rapid assessment such as this it is not possible to get a complete and thorough picture of each household's socio-economic status, both due to time and "trust" constraints, but the findings should be regarded more as a broad-brush illustration of where each family stands.

In addition to the informal, coincidental meetings and more formal interviews with indicator households, the research-

ers spent a lot of time walking within and around the village to get a sense of how villagers used and interacted with the local environment and natural resource base. This was very useful in confirming or refuting statements or opinions offered by villagers. For example, the height of flooding could be confirmed by evidence of "tidemarks" on concrete poles or the area of paddy fields abandoned could be assessed by actual inspection. The transect walks often brought to light other areas of concern in the village as well, such as evidence of massive deforestation of community forests for eucalyptus plantations by a Japanese pulp and paper company. At the same time, by moving between village by local boat, the researchers were able to witness the present state of the Nam Hinboun river over a 65 km stretch and note the degree to which erosion and sedimentation are altering its nature.

The field assessment took place during 10 days in late May, 2007.

3 Study Findings

The rapid assessment in five villages in the Nam Hai-Nam Hinboun valley found a number of dam-related impacts that are common to all villages and some that are specific to just one or two, while some impacts may be specific to individual households who are vulnerable in some way. The impacts common to all villages will be discussed first, as they are of most immediate concern.

3.1 Flow regime alteration

Since the Theun-Hinboun dam and power station infrastructure was completed and water first diverted in December 1997, there has been a profound alteration in the natural flow regime of both river systems. This has tended to upset the ecological balance of the Nam Hai and Nam Hinboun rivers and cause downstream disruption to communities in ways both foreseen and unforeseen. The changes tend to be more pronounced in those villages nearer to the powerhouse, thus impacting Ban Tha and other villages on the Nam Hai proportionately more than villages further downstream nearer the Mekong.

People living downstream were impacted from the moment the first flush of water was released from the turbines in the dry season of 1997/98. The villagers found that the river water they formerly used for bathing, clothes washing, domestic supplies and drinking was now flowing much higher, stronger and dirtier than they had ever known it before at that time of year. For most, they had no alternative but to carry on using the water in the river, as there were no other convenient sources nearby, although some started to make long treks to nearby shallow wells, springs and streams to find cleaner water. At the same time, riverbank vegetable gardens already planted were damaged by flooding or washed away by aggravated erosion as the water levels started fluctuating on a daily basis. The villagers had to abandon them or move them further up the banks, thus losing valuable sources of household nutrition in the dry season.

Fishing nets, boats and property that used to be left safely on the riverbank were frequently washed away in the first dry season, as the villagers were not accustomed to the new flow regime and took time to adjust. Traditional fishing gears and those used by women and children suddenly became redundant in the new flow regime. Furthermore, villagers had no way of knowing exactly when the water would rise and fall, although they gradually saw that it was set to a rough pattern of daytime operation, followed by night time closure. However, often this pattern would be broken by periods of 24 hour operation and occasional periods of complete shutdown for a day or two. Hence, the hitherto predictable seasonal flow patterns were now totally unpredictable and in the hands of THPC.

The river flow in the dry season, formerly comprised of shallow riffles and slow flowing deep pools, suddenly became powerful and fast flowing with turbid conditions, so villagers could not predict the depth of the water. Villagers who used to be able to walk across the riffles and get access to fields or forest on the other side were no longer able to do so. People were no longer able to visit friends and relatives in villages on the opposite bank, as the water was too deep and unpredictable to ford, unless they took a boat across or took their chances during turbine closure periods. Basically, the river in the dry season had become a much more hostile and risky place to be. Parents had to call their children away from the edge for fear of being swept away, and a whole new level of safety awareness was required by the people living downstream. Livestock too were now at danger from drowning, as previously cattle, buffalo, goats, pigs, etc., could safely cross from one side of the river to the other.

In the wet season (roughly May to November period) the changes in hydrology are not so pronounced as the dry season. In the wet season, the power station generally operates around the clock, although its operation adds an extra 110 m³/s to the baseflow of the Nam Hai and Nam Hinboun Rivers.

«... the rising water caught the boy unaware and washed him downstream to his death.»

By comparison, during the dry season, when in-flows to the headpond are much smaller, the power station must operate on a variable pattern¹⁰. Whereas in years before the project commenced operations, water levels would hardly fluctuate at all on a daily basis during the long dry season, there are now daily fluctuations of up to 2 m in the Nam Hai and parts of the Nam Hinboun immediately downstream of the confluence at Ban Vangdao, gradually reducing in magnitude as one moves further downstream (Schouten et al, 2004). Such great daily fluctuations in flow and water level have not only destabilised the river's natural hydrology, its ecology and seasonal patterns, but also made the Nam Hai and Nam Hinboun more dangerous rivers for local residents.

This is illustrated by the case of Ban Tha, where two men and one five year old boy have drowned in the past two years. One of the adults drowned whilst crossing the Nam Hai in a boat with his wife when it capsized and both occupants were washed away in the fast current. Neither could swim, and while the woman was rescued by a villager, the man was sucked under and drowned. The second adult was a man bathing in the river when it was high and fast flowing and he lost his grip and was pulled away by the current. They did not find his bloated body until three days later, when the turbines were closed down for a while. He was missing a front tooth, which the villagers took as a sign he had been taken by a *ngeuak*¹¹.

While some might argue that these first two incidents were just unfortunate accidents, unconnected to the dam's operations, the third was a direct result of THPC's actions, and

indeed they admitted some liability by paying compensation to the boy's parents, according to villagers in Ban Tha. Apparently the boy was playing at the edge of the Nam Hai during an unannounced shut down of the turbines during the 2006/07 dry season and when the turbines were re-opened (again unannounced), the rising water caught the boy unaware and washed him downstream to his death. On learning of his death, THPC gave the parents 300,000 kip¹² in compensation for the loss of their son. According to the headman of Ban Tha, since 1982 when he first came to the village, there had only ever been one case of a child drowning in the Nam Hai.

While people have become steadily more used to the fluctuating water levels and alterations in current velocity over the years since the dam was commissioned, many people



Child swimming across the river near Ban Tha.

BOX 1. A Bridge over the Nam Hai – a broken promise?

Before the flows of the Nam Hai were altered by water diversions, it was recognised by several parties that the extra dry season flows would be disruptive for people crossing the river; previously a simple task for people and livestock. (for example, see MIDAS Final Report, 1995).

Nearly all villages along the Nam Hai suffered loss of access to land and natural resources following the dam, but Ban Tha – Ban Thamtem and Ban Kongphat – Ban Vangdao were the hardest hit. The latter crossing at the confluence of the Nam Hai and Nam Hinboun was particularly important for local villagers, as it provided access for at least three villages downstream to the new road along the powerline to Ban Nahnin market and Route 8, and was also used by children to get to the secondary school in Ban Naphouak on a daily basis. Following dam completion, people crossed the river by boat, at first paddling, but later by means of a steel wire put up by EMD which allowed the boat to be pulled across the river. As the river got wider due to erosion, this crossing has become progressively more hazardous and tricky, with school children having to use it twice a day in all weather conditions.

THPC's Logical Framework: 2001 – 2006 included the construc-



Nam Hai-Hinboun confluence at Ban Vangdao – site of the proposed bridge.

tion of a "Minor Crossing" over the Nam Hai in 2003, although the location of the crossing was never disclosed. The 1st Quarter 2002 Quarterly Compliance Report of EMD to THPC states, "The consultant (Chareun) has submitted his report recommending the construction of a small suspension bridge by THPC. This will be considered for action in the next dry season." However, this line item mysteriously vanished from subsequent Quarterly Compliance Reports. Despite this, the EMD Review team in March 2004 were told by the Deputy Manager of EMD that the suspension bridge was designed for the Nam Hai crossing at Ban Vangdao, and was awaiting budget approval to construct it. Villagers in Ban Vangdao and Ban Kongphat expressed hope that it would be built soon, as they were worried about the safety of themselves and their children and it would make life much easier for many people if there was a bridge. In May 2007, there was no sign of a bridge or even the wire pulley system for pulling a boat across and the crossing was now wider and more dangerous than ever, due to steeper and more eroded banks.

A recommendation of this report would be to build a bridge across the Nam Hai at this location, between Ban Tha and Ban Thamtem, plus any other village locations where local access has been compromised by the changed flow regime.

told us they still get caught unawares by the unpredictable changes. Occasionally the turbines get closed down for maintenance (or perhaps due to a decline in power demand from Thailand) and the river falls to its natural base flow. These conditions are now a prime fishing time for villagers, as the fish become concentrated in shallow pools, the normally turbid water becomes clear, and it is easy to use a variety of fishing gear which would normally be impossible to use when the turbines are open. The villagers will set nets and hooks in pools and catch fish with lift nets, scoop nets and other small fishing gears. Sometimes THPC sends official warning about the closure, at other times the closure is unannounced and the villagers have no idea how long the flows will be low or "normal".

Several fishers told us that they have lost gillnets every year since the dam was built, because they set nets overnight and returned to them in the morning to find the water level had risen and the net had been swept away. The main problem is not just the flow, but the leaves, twigs and

other debris the flow picks up when it resumes, which get entangled in the net and act as a drag. One villager in Ban Xang told us he had lost his boat also, having not tied it up securely when the water level was low during dam closure.

Apparently, THPC compensated villagers for lost boats during the first dry season only as far downstream from the power station as Ban Thonglom, but beyond that point and since 1998, no compensation has been paid for either lost boats or fishing gear, even after unannounced dam closures. There is clearly a lack of due process in accounting for such losses, particularly when the company has failed to inform villagers about the power station's operating schedule in advance. The mechanism for warning villagers in advance of power generation schedules and water level changes also needs to be urgently reviewed and a more responsive and robust system put in place. This is not only a matter of avoiding economic losses by villagers, such as fishing nets and boats, but, as the drownings in Ban Tha illustrate, a matter of public safety.

¹⁰ The actual discharge and operational pattern is largely determined by the Power Purchase Agreement with EGAT, but constrained by natural variables in Nam Theun flow.

¹¹ The *ngeuak* is a mythological serpent-like creature, which is believed to haunt rivers and deep lakes, which occasionally takes hapless victims who stray too far from the edge. The missing front tooth is apparently a sign of having been singled out by the *ngeuak* of the river.

¹² 300,000 k equates to about \$30, at the June 2007 kip/US\$ exchange rate

« ...The biggest impact of this aggravated flooding has been on the villagers' rice production system.»

3.2 Aggravation of flooding

It was not surprising to find the knowledge system of the affected households about flooding and its causes and effects was superior to that of the Consultants. ... Every *na[a]*¹³ complex, and each part of it, were known to be affected by floods in different ways, and the terminologies to describe land in the floodplain are based on fine differentiation of flood risks. Discussions with village “flooding experts” revealed a sophisticated appreciation that the Project’s effects were adding to a natural flooding pattern, which was probably itself changing. Many of these experts pointed out that the Nam Hai erosion was the biggest problem causing natural floods to become damaging. They considered the rates of water level rise and flood recession were now perceptibly different from those previously observed for floods of the same magnitude. (p. 2-158, RMR, 2006)

The passage above acknowledges the detailed agro-ecological knowledge held by local people, all too often ignored or disregarded by hydropower consultants during EIA studies. In all 5 villages the researchers visited, virtually everybody interviewed reported greater flooding as one of the main changes that had taken place since the dam was built and they attributed these worsening floods to the increased flows released by the dam. The biggest impact of this aggravated flooding has been on the villagers’ rice production system, notably the practice of wet season rice paddy (or *naa bee* in Lao). It was usually one of the first things the villagers raised as a matter of concern. They stated that flooding had always been a problem in both the Nam Hai and Nam Hinboun basins, but they generally managed to remain self-sufficient in rice by storing the harvests from

good years to see them through the years of major flooding when they got poor yields. Very occasionally, low lying *naa bee* were lost altogether from prolonged flooding, but if they had surplus rice from the previous year, then that would see them through the next year. Villagers knew and understood the risks from natural flood events and took preventative measures to avoid rice shortages.

The villagers reported that it was not until about 2000/2001, after several unsuccessful attempts to plant *naa bee* and having suffered serious losses, that they began abandoning the rice fields on a large scale. Since then the trend has continued with villages giving up large areas of formerly productive land. This reality was apparent from the point the researchers entered the first village on our itinerary – Ban Nong Boua – and walked across an area of abandoned paddy on land bordering the Nam Hinboun. There was just one family starting to clear the weeds from the fields, in preparation for ploughing, whom we interviewed. The villager told us that he had not tried planting *naa bee* in these fields for the past 5 years, since flooding had destroyed successive crops following the dam’s completion. He would try planting again this year to see if he could get some rice, but to cut his losses if it did flood again, he was not going to transplant seedlings like they used to do, but was going to try direct sowing instead. He said that in the past, before the dam, he used to be able to get 50 – 60 sacks from his 3 rai of *naa bee*, which is a quite respectable yield by Laotian standards¹⁴. Altogether, Ban Nong Boua has reportedly abandoned 35 ha of paddy land since 2000 (See Table 21.27. RMR, 2006).

Floods near Ban Nong Boua in recent years have commonly lasted one month, whereas they used to only last 15

BOX 2. Case of Ban Kongphat flooding

Ban Kongphat lies just upstream of the Nam Hai and Nam Hinboun confluence and experiences a pronounced backwater effect from the influence of increased flows in the Nam Hai, causing water to backup past the village during periods of power station operation. It is on a low-lying area of land with paddy fields (*naa bee*) both downstream between the Nam Hai and Nam Hinboun channels and opposite the village on the south bank of the Nam Hinboun. The *naa bee* were always at threat of flooding in the past, but because of good fertile soils they could obtain enough rice from a non-flood year to see them through the next year. The villagers claimed that they never entirely lost the rice crop prior to the dam, but flooding started to get worse during the construction period from the mid-1990’s onwards. In 1997, the headman claimed that out of 30 families in the village, 25 were rice self-sufficient. Since then the situation has radically altered, with presently only four or so families out of 44 fully rice self-sufficient. The cause of this massive turnaround has been due to more severe flooding, according to local villagers. Since the dam was built, the



Giant catclaw mimosa weed invades abandoned paddy in Ban Kongphat.

frequency and duration of flooding has increased, with a corresponding increase in water turbidity. Villagers stated that floodwaters in the 1990’s would usually only last three or so days, but since 2000 there has been an increase in the length of time that water remains on their

fields. In the last few years floods have lasted for eight days or more. However, it is probably the issue of greater turbidity and a reported “smothering” of rice plants with sediments (see Section 3.3 for more details) which has been most responsible for the drastic decline in rice production and mass abandonment of more fertile floodplain *naa bee* for more marginal and less productive upland rice or newly created paddy fields on higher alluvial terrace land. Because these new areas are further away from the village than the old *naa bee*, the villagers have to spend a lot more time getting to and from their fields now. It has also caused the loss of community forest areas previously used as places to gather a variety of NTFP’s.



Headman of Ban Kongphat points to 2005 floodlevel.

days or so pre-dam. Ban Nong Boua is reportedly the upper limit for influence from any backwater effect from the Mekong, when under flood conditions (RMR, 2006). As one moves further upstream along the Nam Hinboun, the duration of reported flooding gradually decreases but the losses of rice crops from flooding remain high. Only in Ban Thonglom have villagers persisted in practicing *naa bee* on floodplain fields, but still reported that they lose all or part of their rice crops to floods each year. 2005 was a total loss year, with floods remaining on the fields for around 45 days. Ban Thonglom villagers claim that before the dam they never experienced total crop losses from floods, as the water was less turbid and the plants could tolerate submergence for longer. Since the dam was built and the water has become more turbid, 15 – 20 days has become the critical duration for flooding, beyond which the rice plants tend to rot and die. Other villages confirmed a similar duration as being the tolerance period. The evidence of massive declines in rice production in recent years was not only apparent from interviews with villagers, but also self-evident from the number of unmaintained and/or abandoned rice barns (*lao khao*) in the village, plus abandoned *naa bee* and



Abandoned paddy fields in Ban Xang (above), and Ban Nong Boua (below).



¹³ *Naa* is the common Lao term referring to lowland rice fields

¹⁴ Between 1990 – 2000, rice yields nationally in Lao PDR were reported to have increased from 2.3 to 3.1 tonnes/ha on average (Maclean et al, 2002)



A respondent talks about the increased prevalence of skin diseases during floods.

field huts (*tiang naa*) (see photos at right).

Apart from contributing to declines in rice yield, production and food security in the Hai and Hinboun valley villages (corroborated by evidence in the Theun-Hinboun Expansion Project draft EIA (RMR, 2006) and Barney's report on Ban Pak Veng), the increase in flooding severity has had a number of other negative impacts on villagers' livelihoods and well-being. These impacts include:

- **Loss of mobility and ease of movement during floods.** Everyone has to climb into a boat every time they want to leave the house, even for a simple task like going to the toilet. For families who do not own a boat, the floods are a period of extreme hardship, as they have to either wade through the floodwaters (often quite hazardous due to their depth and turbidity) or have to rely on borrowing a neighbour's boat. While neighbours are often quite willing to lend their boat, the favour can often strain relationships if it is not reciprocated in some way. As it is the poorest families who tend not to have a boat, the poor are inevitably hit the hardest during floods.
- **Public health concerns.** Extended floodwaters in and around the village can cause or contribute to public health problems in several ways. The first is the trans-

mission of skin diseases for people who have to wade in the water, especially of the feet and toes. This complaint was commonly reported and was also found in Ban Pak Veng (Barney, 2007). The second problem is the contamination of drinking water, either in the THPC-provided wells or other local water sources, which then become unsafe for drinking. As people inevitably have little choice but to take drinking water from these sources, and people may often be short of firewood for cooking and boiling water, then bacterially contaminated water is frequently consumed. Thus cases of diarrhoea and water-borne intestinal diseases are said to increase during and after floods. This can often lead to further contamination of the water, as for some villages the nearest piece of dry land can often be several hundred metres away from the house and toilets are all flooded in any case.

- **Loss of livestock and other property to floods.** If the floods come suddenly, then often villagers get caught unaware and may end up losing or damaging some property which could not be saved in time. In an extreme case, these may be valuable items like boats or pigs and chickens, which are either expensive to replace or irreplaceable. We did not hear any cases of larger live-

stock being lost, like buffalo or cattle, as the villagers usually take these to higher patches of forested land outside the village during the height of the rainy season. It is more common for villagers to lose other items to floods, like boats, wooden implements or stored wood under houses, which can be replaced but cost time and money. A potentially flood-related disease epidemic of cattle and buffalo was noted occurring in Ban Pak Veng in July-August 2006, which caused an estimated \$6,500 loss for villagers¹⁵.

- **Decline in availability of food and spoiling of food, for both humans and livestock.** One of the more serious issues commonly reported was the difficulty during periods of prolonged flooding in obtaining food for both people and livestock. When fields, vegetable gardens and areas of common land are inundated, villagers are forced to travel a long way to high ground to collect enough food to eat. Some people reported that they commonly go hungry during the floods. Additionally, food for humans and livestock is destroyed or spoiled, such as rice and rice bran, while the village rice mills are forced to

stop work during flooding. The abandoned paddy fields, which have now become more important for buffalo and cattle grazing, lose their ability to provide food for the livestock until the water recedes and the grass grows again.

- **Death of beneficial plants and trees.** When the floods recede, leaving a foetid, muddy mess in their wake, useful plants and trees in and nearby the village often die, either directly from extended root inundation or later from disease. These plants are often important food sources for villagers, thus extending and exacerbating the food shortage period, and forcing people to go far and wide in search of sustenance. Ironically, in most of the villages we visited, the villagers explained that one of the reasons they have given up planting vegetables in the THPC-provided vegetable gardens (often referred to locally as "*suan Theun-Hinboun*") was because of the death of the fruit trees given by the company. In the case of Ban Tha and Ban Xang, the majority of the fruit trees have died because of flooding and have not been replaced (see photos below).

¹⁵ Described in a letter from Mr Keith Barney to Mr Bobby Allen, General Manager of THPC, dated 22 October, 2006.



Imperata grass invades an abandoned replacement garden in Ban Xang.



Mango and other fruit trees have died as a result of worsening floods.

3.3 THPC's position on floods and flooding

Before the THHP was completed and power generated, there were concerns from villagers downstream and others about the risks of aggravated flooding on the Nam Hai - Hinboun Rivers from the project (e.g. FIVAS, 1996; Claridge, 1996). In 1996, Claridge stated that there was likely to be an “increase in the length of time paddy fields are flooded, leading to more years when rice crops are lost due to extended flooding. This will come about through both increased time when ‘over the bank’ flooding occurs, and also through the longer period of backing up of tributary flow by the increased flow in the Nam Hinboun. It should be noted that the people in all the villages surveyed stated that rice crops are totally lost to flooding on an average of one year in four.”

The risks posed by flooding on the Nam Hai-Hinboun Rivers were recognized by official studies commissioned by THPC during the construction phase, including the potential role of sediment in aggravating flood damage¹⁶ and the possibility of a 10 – 20 cm flood surcharge on the Nam Hinboun above Ban Kengkhot¹⁷. Norplan A.S (1996) asserted that flood protection would not be practical upstream of Ban Kengkhot due to topographical conditions (i.e. the limestone gorge downstream) without incurring “unreasonable expense” (p. ES-6) and recommended instead either closing the power station during bankfull periods, or resettling villages from “flood-prone areas along lower Nam Hai / Nam Hinboun to safer areas such

as the upper Nam Hai, by providing cleared land and flood protection.” (p. ES-7)¹⁸. The same consultants recommended in the EIA (p. 18) that, “It is in the interests of THPC to document in more detail the flood level / flow relationship prior to diverting water into the Nam Hinboun in order to negotiate on future claims of flood damage caused by the project.” According to THPC project consultants and authors’ of both the MCP and THXP EIA, these studies were not carried out and neither has monitoring of post-diversion events (p. 2-156. RMR, 2006). The consultants believe that,

“Had the patterns of rainfall and flooding been more favourable, the risk could have paid off. In the event the Project has to accept that:

- a) It has saved substantial sums of money over the last eight years of profitable operations by not following the recommendations of the EIA.
- b) It has significantly aggravated the losses that have occurred as a result of floods since 1998.

It is recommended that the Project immediately move to reach agreement with householders about how much of the losses, induced by floods and flood sediment effects, so far accumulated shall be compensated by the Project.”

When interviewing villagers, the researchers failed to find a single person who had received compensation for losses suffered from flooding. Furthermore, according to the draft EIA for the THXP (RMR, 2006, p.2-158), “Villagers have been told by EMD personnel that the Company cannot provide any compensation if villagers cite flooding as

«*Nam ben kii tom* – the water is muddy»

the basis for their request... The official position that the Project has not made flooding worse was recognised by all village informants and village families as one of those ‘realities’ about which arguments are never entered. It could have reduced the willingness of some families to put forward their views of the causes of flood damage”. Despite this opinion, it is interesting to note that during a meeting between EMD staff and villagers in Ban Pak Veng to listen to concerns arising in relation to the THXP, Barney (2007) says that the two most critical points raised by villagers were:

1. We have no rice to eat, no paddy. This is because of Theun-Hinboun, and the flooding, every year it comes, and quickly. We request rice to eat.
2. Our village areas have flooding. We request to move the village, to clear an area for a new settlement, and to build a road to new settlement area.

The villagers also raised critical points about the flooding curtailing areas to raise livestock and health problems that are linked to flooding. Thus, this would suggest that the villagers are actively demanding compensation for losses that they fear will arise from a future enlarged project releasing more water into the Nam Hai-Hinboun system. The present rapid assessment tended to confirm this view, through the sheer numbers of villagers who pointed to the THHP as being the main cause of worsening floods.

Villagers point out that it is not just the height and duration of flooding that damages or kills their rice crops, but the fact that the water is now much more turbid than before. “*Nam ben kii tom*” – “the water is muddy” – was the most common description. This, villagers explain,

covers rice plant leaves and remains as a silt layer on the plants when the water subsides, thus blocking sunlight from reaching the leaves. Growth stops and then the plant starts to die, with the roots rotting. Prior to the dam, the water was much clearer during floods, so the plants could tolerate floods for longer. Thus, rice plants may be more vulnerable to flood damage caused by increased suspended sediment levels, even if the height and duration of floods had remained the same over the past nine years. In any case, villagers reported that floods tend to remain much longer than before in all villages visited, with the possible exception of Ban Tha where some people said the flooding duration is shorter, but flood peaks have been higher in recent years.

Despite this evidence, THPC have repeatedly denied responsibility for aggravated flooding on the Nam Hinboun or deflected blame on to external factors, such as the influence of the Mekong. For example, most recently in February 2007, Stephen Sparkes (EMD Manager) in a meeting with International Rivers Network (IRN) staff claimed that the THHP is not a major contributor to flooding in terms of water volume, and sedimentation in the Nam Hinboun was only a problem as far downstream as “the gorge”¹⁹. More specifically, he stated, “After the gorge we are one factor causing flooding, but the Mekong backwater is the greatest cause”. This position contradicts the findings of the RMR EIA, which believes that the Mekong backwater effect only influences flooding as far upstream as Ban Nong Boua or thereabouts.

¹⁶ Theun-Hinboun Environmental Studies: Study A: Rural Development and Land Use, Section 3.3, paragraph 97, Midas Agronomics & Burapha Development Consultants, Theun-Hinboun Environmental Studies, Final Report submitted to Norplan A.S., October, 1995.

¹⁷ AB Hydroconsult, Impact Studies for Theun-Hinboun Power Project, Lao PDR. Study C – Hydrology, Hydraulics, Erosion and Sediment Transport. Final Report, page 19, October 1995.

¹⁸ NB: Underlining in original document

¹⁹ “The gorge” refers to a narrow limestone gorge section downstream of Ban Kengkhot to Ban Thonglom, through which the river flows without a floodplain and was known to cause occasional aggravated flooding for the villages upstream well before the Project was built.

«Hardly a day goes by without a new portion of village land collapsing into the waters of the Nam Hai...»

3.4 Erosion and sedimentation

We will consider the impacts of erosion and sedimentation starting at the top and working downstream. The villagers of Ban Tha, like those of Ban Thakong and Ban Nakhom upstream, are now very familiar with the twin phenomena of erosion and sedimentation. Hardly a day goes by without a new portion of village land collapsing into the waters of the Nam Hai and being swept away downstream as suspended solids or bedload material.

The Nam Hai river at Ban Tha is now a broad and fast flowing river when the turbines are open, with long sections of actively eroded river bank, especially on the outside of bends. According to villagers, it is also a shallower river than it was before the dam. That is to say, there are no deep pools in the river as once were the norm (up to 9 m deep), but rather a series of shallow pools (2 – 3 m deep) all filled up with sand and a number of obstructions like tree trunks littering the river bed. The river is now far wider than its pre-1998 width (25-30 m on average), perhaps by a factor of three to four times. For example, a mango tree which used to stand 30 m from the riverbank in 1998 is now just a few metres away from the water's edge and liable to topple in the water any time.

Even the *Suan Theun-Hinboun* (replacement vegetable gardens) on the edge of the village are gradually falling into the river one by one. Many villagers have lost their land, fields, riverbank gardens and other property such as fruit trees to the erosion occurring along the Nam Hai in Ban Tha and other villages upstream such as Ban Thamtem, Ban Thakong, Ban Nakhom and Ban Namsanam. Some villagers the researchers spoke to expressed disappointment at the lack of direct compensation for these losses, but seemed to have given up hope of seeing justice. They seemed somewhat resigned to the fact that the EMD development programme has thus

BOX 3. Case of uncompensated lost land to Nam Hai erosion

The first respondent interviewed in Ban Tha, Mr Virat, took the researchers to see his tobacco plot lying on the east bank of the river. Although on a relatively straight section of river, the river currents were actively undercutting the banks, causing the soil to crumble in chunks into the waters. In fact, while we were standing there, we saw this process in action as a small portion of bank broke away. According to Mr Virat, the most rapid erosion tends to take place in the dry season, when the Nam Hai's entire flow consists of the diverted water. Since November 1996 he has seen around a 5 m wide strip of land retreat into the river. This land is his family's main source of livelihood and each bank collapse means a little less land to grow his crop on and a little less income. When he was asked about compensation for this loss, Mr Virat responded that he had received none. He used to grow *naa bee* rice on this land, but it became more difficult after the flooding got worse post-dam, and he now prefers to grow tobacco on the lower terrace rice fields in the dry season and concentrate rice cultivation at a slightly higher elevation (which is still flood prone nevertheless). Tobacco has meant the family are getting into debt, with three years of profit and one of loss (this year). Mr Virat cannot really afford to lose much more land to erosion, but at the moment he has little choice but to accept his lot, as there has been no compensation offered by THPC.

far been the only “compensation” available for their lost land and property.

Below the Nam Hai – Nam Hinboun confluence, areas of rapid erosion are still highly evident, with many sections of undercutting, slumping, shearing and collapsing banks all the way down to Ban Nong Boua and beyond. It was quite apparent that sedimentation features tended to become more common the further downstream one goes from the



Bank erosion has accelerated since dam completion.

Nam Hai-Nam Hinboun confluence. These include massive long sandbanks, like that situated in front of Ban Nakhok, in the middle Hinboun, where the river course has clearly changed in recent years and is now further from the village. For most villages the researchers saw on the boat trips upstream from Ban Nong Boua to Ban Kongphat, there was active erosion proceeding along the riverbanks, causing residential land to collapse. The problem seemed to be particularly bad near some of the dry season irrigation pipes, the support of which had already been washed away at some locations. Another sign of the ongoing erosion was the number of large trees, either about to fall in the river, half-fallen in or already in the river and littering the streambed.

It was clear that despite the problems associated with practicing riverbank agriculture due to fluctuating water levels and increased erosion, villagers have not abandoned this dry season practice, but are persisting with it in many places, albeit under new and more challenging circumstances. On questioning, this return to riverbank agriculture appeared to be more connected to the failure of the *Suan Theun-Hinboun* compensation measure, than any



Nam Hinboun bank slumping is a common sight.

other single factor. (See Box 7 for a description of problems related to the replacement gardens). Thus through lack of viable alternatives, villagers were obliged to return to cultivating the riverbanks, putting up with the more difficult conditions to eke out a livelihood. Ironically, this practice will tend to exacerbate the problem of bank erosion, thus causing a further decline in system sustainability. Villagers are also less likely now to invest time and effort in stabilising the riverbanks through terracing as they would have done in the past.

At every village the researchers stopped at, villagers related how the new flow and sediment regime had caused a rapid shallowing of deep pools nearby the village. Previously these pools had been important dry season fish refuges, where fish could seek safety in the rock-strewn depths during periods of low-flow and villagers could use a variety of methods to catch them. Some were considered conservation pools (*wang sanguan*) and had special rules attached to their use as a way to avoid overfishing. For example, in Ban Thonglom the pool in front of the village used to be 7 m deep before 1998 but is now less than 2m deep, while



a deep pool about a kilometre upstream from the village in the limestone karst gorge used to be 12 *wah*²⁰ deep, but is now just 5 *wah* deep, according to the village headman. These pools used to be some of the best fishing spots in the whole river during the dry season, but are now filled with sand and mostly devoid of fish. The only time when they are worth fishing is when the turbines are shut and the water level falls, leaving the fish stranded in these shallow pools and easier to catch. A former semi-professional fisher in Ban Nong Boua told us about a pool just upstream from the village on a sharp bend which used to be very productive before the dam. He would fish it by putting a castnet across holes in the rocks and flushing out the fish – it was an easy way to catch about 20 kg of fish in just a few hours. Now the pool is filled in with sand and the rocks are buried. It's hardly worth fishing there these days, he said.

As described above, a direct consequence of the erosion and sedimentation has been a significant change in the turbidity of the water, which is patently obvious to anyone who views the Nam Hai and Nam Hinboun rivers these days. While this is most obvious in the dry season, when previously both rivers were crystal clear during conditions of low flow, the changes are perhaps less obvious in the wet season when rainfall run-off would have led to varying degrees of turbidity in both rivers. Since the dam's construction, the Nam Hai and Hinboun stays brown and coloured more or less permanently, and only clears up when the turbines are switched off (a very rare event in the wet season). Hence, when floods occur post-dam, the river now carries its extra suspended sediment load from upstream erosion, much of the finer portion of which ends up being carried onto the floodplain paddy fields and smothering the villagers' rice plants. It is this



mechanism which is believed to have done as much, if not more, damage to the villagers' rice production system over the last nine years, as the extra volume of floodwater now being released.

Project documents completed prior to dam completion show that not only were most of the erosion and sedimentation impacts predicted, but also some relatively detailed recommendations were offered to mitigate them. According to the Norplan A.S 1996 study:

After the TH diversion, the Nam Hai will be changed from a river drying out each year to one constantly experiencing the annual peak flood event. Such continuous high flows will probably result in bank erosion lasting many years, until the channel is wide enough and finds a new stable gradient and cross-section. Much silt from the erodible Nam Hai river bed may be washed downstream into the Nam Hinboun where it is likely to settle during the more prolonged flooding of the Nam Hinboun. This may also contribute to slightly increased flooding levels along the Nam Hinboun and lower Nam Hai above present conditions. (p. ES-6)

Material washed downstream is filling up pools with sediment (far left). Nam Hinboun gorge used to have deep pools and was formerly a popular fishing site (left).

According to RMR (2006), a report by Norconsult in February 1997²¹ that was included in the Theun-Hinboun Operations Manual recommended several measures to increase channel competence, reduce rates of riverbank land loss, while reducing erosion and excessive sediment transport in the Hai-Hinboun system, namely (Table 21.2, p. 2-24):

1. Protection of river bank. A total of 6.38 kms of river bank at 33 locations along the Nam Hai were identified as requiring bank protection. These were ranked as needing immediate protection, high level surveillance or low level surveillance.
2. Canalisation and widening of the Nam Hai using excavated material to create embankment dikes.
3. Extraction and clearing of trees and other obstacles.

According to RMR (2006), by the time of compiling the EIA for the THXP, only 0.475 km length of riverbank described as requiring "immediate bank protection" had been protected, and no canalisation and widening or removal of trees and obstacles from the river channel had been carried out. It seems that the only money actually spent on erosion mitigation was \$164,000 on "unsuccessful experiments in bank stabilisation by September 1999." In April 2002, a consultant was hired to advise EMD on future monitoring and mitigation of the Nam Hai erosion (Wronski, 2002), but it seems that apart from some continued monitoring of 11 established benchmark sites, none of the five mitigation measures recommended were implemented.

Furthermore the THXP EIA states that most of the banks originally targeted for protection are now lost to erosion and by 2005, "some 461 large dead trees and 92 large clumps of bamboo in the Nam Hai needed to be removed. More seri-

ously the channel had widened by about 45 m with erosion of 68 ha (7 million tons) of river terrace." The degree and extent of erosion that has occurred on the Nam Hai river channel is clearly illustrated in a series of TSSD images²², which compare the pre-project channel course and width with that of May 2006 (Figs 21.2 – 21.4). As a result of this failure to protect against erosion, RMR (2006) (p. 2-25) conclude that, "The Nam Hai has become de-stabilised and delivers about one million tons of sediment into the Nam Hinboun every year. There is no sign that the erosion is in decline, and the Consultants opinion is that it has accelerated between 2002 and 2006." If the above statement is correct, then it would suggest that one of the principal causes of downstream flooding is not so much the volume of water released from the THHP, but the vast volume of sediment eroded and now actively settled in and filling the Nam Hinboun river channel, thus reducing its ability to pass high flows (M.Watson, personal communication.). This hypothesis would tally with what the villagers have been observing over recent years.

It would seem odd then, given the rather direct and obvious links between the THHP water releases into the Nam Hai, recognised by most consultants ever hired by the Company, that the THPC General Manager should try to pass the blame on to smallholder tobacco farmers for being responsible for riverbank erosion, during an interview with a PhD candidate researcher in March 2006 (Barney, 2007). In short, THPC has continually avoided financial expenses related to erosion and sedimentation mitigation during the past nine years, thereby setting off a chain of events which has exacerbated the original problem and led to worsening problems for villages downstream in the form of more serious flooding and increased smothering of rice plants by suspended silt, causing declines in yield and income for thousands of families.

²⁰ A *wah* is a Lao and Thai measurement of length, equivalent to about 2 metres. Thus, the pool described here must have been approximately 24 m deep in the past.

²¹ This report, not seen by the author, is called "Erosion Protection, Canalisation and Removal of Obstacles in Nam Hai, Norconsult, February 1997; THPC, Theun-Hinboun Power Plant, Overall Manual for Operation and Maintenance, 1998". Source: RMR (2006)

²² TSSD is an acronym for Tethered Sites Surveillance Device, which is basically a camera attached to a helium balloon, which is used to cheaply and rapidly gather aerial shots of specific locations, in this case sections of river channel. Various TSSD images of the Nam Hai and Nam Hinboun Rivers can be accessed from the following website: www.flickr.com/photos/balloonaerialphoto/



Ban Thonglom villagers bathing in the river as well water is insufficient.

3.5 Changes in domestic water quality and availability

From the very start of dam operations in late 1997/early 1998, villagers complained about difficulties in obtaining clean domestic water, due to the flooding of shallow wells dug on the lower banks of the Nam Hai and Nam Hinboun, which were previously the main source of drinking and household water during the dry season (Shoemaker, 1998). This immediate impact on villagers' lives not only created unpleasant, dirty water for washing and kitchen uses, but was also a potential health concern, as villagers no longer dared to drink the murky water.

While EMCO and its successor EMD commenced digging wells in villages from 1998, starting with the upper Nam Hai and Headpond villages first, it has taken the Company many years to get to all 61 impacted villages. During the present visit, all five villages were found to have wells that had been constructed with the help of THPC funding, although labour for digging and wood for the roof was usually donated by the villagers. The Company would pay for the cost of the concrete rings, cement, sand, reinforcing

rods and zinc sheeting for the roof. The general ratio of households to wells was usually found to be about one well for 10 – 15 households. In most instances villagers mentioned the wells as being of benefit to the village and were generally satisfied, as it saved them longer trips to the river or a well outside the village. Overall water supply was not the issue of greatest concern to most villagers the researchers interviewed. However, there were notable exceptions where the wells had not solved the village water supply problems.

For example in Ban Xang, the four wells dug by EMD have dried up during the dry season on occasion. The villagers used them for just drinking and kitchen uses (e.g. washing vegetables and dishes), but still used the river for bathing and laundry to save water in the wells. They asked us why EMD staff told them not to use the Nam Hinboun water for drinking and wanted to know if it was poisoned with chemicals. In Ban Thonglom, several of the wells had hit solid rock – porous limestone – which limited the depth to which they could be dug and the length of time they held water. When the researchers visited in late May 07, at least two of the five wells were dry, so a large proportion of vil-

lagers were still using the Nam Hinboun for bathing, laundry and domestic use, while drinking water was mostly being sourced from a spring at the foot of a limestone cliff. However, the latter source was not sufficient for the whole village. In Ban Kongphat, several of the wells were dry, apparently not dug deep enough, and villagers were mostly resorting to using river water again. Holes dug at the side of the riverbank were being used for domestic water use, carried home mostly by girls with two full buckets attached to a bamboo stick. In Ban Tha, the well closest to the river was well used, but others further towards the village centre were short of water, often because they had again hit solid rock which restricted their depth.

A common problem across all 5 villages visited was that during periods of high floods, the wells would become contaminated with dirty water and become unusable, even after the floodwater had receded. The second common problem was a tendency for the water levels in the wells to be directly governed by the height of the river water. Thus, while the power station was generating electricity and water was being released downstream, there would usually be enough water in the wells, but during periods of power station shutdown when the water would stop flowing, the wells would dry up. This would mean returning to collecting water from the shallow river or other local water sources for as long as the turbines were shutdown, which sometimes could last as long as three days.

Whereas in most villages visited, villagers put the rice deficiency as their number one problem, the headman of Ban Tha put a clean water supply as the village's main priority. In his opinion, he thought that THPC should help solve the problem of a reliable water supply for the village. He

said their water supply problem was becoming more acute as more people moved into the village and competed for water from the same number of wells, some of which were now useless in the dry season. The headman once asked for rainwater collection tanks, but EMD said it had no money to buy them. He suggested that all the villages downstream of Ban Namsanam ought to be provided with a clean water supply from the re-regulation pond, perhaps by canal or by pipeline, and that this had been proposed in the past by both villagers and EMD staff, but had never been implemented for some unexplained reason. He thought such a tap water supply could probably be combined with an irrigation canal to their rice fields, which again had been talked about over the years, but no more action had been taken. While this option would almost certainly be quite expensive and have considerable maintenance costs, providing rainwater harvesting tanks to each household with a suitable roof might well be a cost-effective solution to the water shortages experienced.

3.6 Fishery and aquatic resources decline

Since well before THHP began operating, it was recognised by several parties that fishing and harvesting of living aquatic resources²³ (LAR) was important for villagers' livelihoods and these products formed a significant part of the protein intake in local diets (e.g. MIDAS/Burapha, 1995; Sparkes, 1995; FIVAS, 1996; Claridge, 1996). Indeed, it was the negative impacts on fish availability and catches that were first pointed out by villagers living downstream of the power station when approached by

²³ Living Aquatic Resources or LAR refers, in this case, to all the non-fish aquatic products (plant and animal) harvested, consumed and/or sold by villagers, including species of molluscs, crustacea, insect larvae, amphibians, reptiles and aquatic plants.

BOX 4. Fishery decline – the case of Ban Nong Boua

Ban Nong Boua is well placed to be an important fishery, as it previously had sections of rapids, riffles and deep pool habitats, with diverse rocky areas that included underwater “rock caves”. There are wide areas of floodplain converted to paddy fields with several small ponds which were inundated most years, providing further rich wetlands fisheries for several months of the year. The village itself lies in the inside of a large meander, giving villagers accessibility to a long section of river, and is only 4-5 kms away from the Ban Song Hong market and Route 13, giving good access to more distant markets. As a result, approximately 50 % of the village households were previously reliant on fishing and the harvesting of LAR for a significant portion of their income and livelihood. When a 62 year old villager who was formerly engaged in fishing as his main occupation was asked to describe changes in fish and fishing since the THHP started operating, he gave the following account:



Ban Nong Boua kids play by river.

“It’s changed a lot. The old fishing spots in the dry season have gone. The water is deeper and stronger flowing than before. And the pools are shallow as they are now full of mud. There is nowhere to set gillnets like there used to be. Only when the

water drops can we catch fish. It’s very difficult to find any fish to eat now. Traders used to come up from Ban Song Hong to buy fish, but now we never see them. The wet season is not so different from before and we can still catch some fish. In the wet season we mostly fish in the fields, streams and ponds. But the floods are worse and longer than before. We now eat fish less than we used to, as they’re harder to catch. Other things, like shrimps (*goong*), shellfish (*hoi*) and filamentous algae (*tao*) have disappeared. If the water’s flowing it’s hardly worth going fishing now as it could take a whole day to catch one kilo. I used to be able to sell 5 kg fish a day at least and sometimes up to 40 kg.”

He says that there is now no one left in Ban Nong Boua whose main occupation is fishing, but rather a few people may catch some surplus fish sometimes and take them to the market in Song Hong to sell. The fish migration periods of May-June and September – October are best and most likely to produce a surplus. “I used to be able to earn 100,000 kip from one



Ban Nong Boua fisherwomen return with a meagre catch.

hour’s fishing. Now I must work hard all day for Oji to earn 20,000 kip,” said Mr Liang, a former professional fisherman in the village who now struggles to earn a living from rice farming and occasional day labouring.

The description of Ban Nong Boua in Box 4 above was quite typical of all five villages, although each village (and indeed family) experienced the changes in slightly different ways and degrees of severity. This highlights the crucial importance of obtaining detailed baseline livelihood data of each family in the impact zone, to accurately assess economic loss from a position of knowledge, something which THPC neglected to do prior to the project being commissioned. For example, two families in the same village may utilise different methods and gears requiring different investment costs, knowledge and skills to operate, but both families may ultimately catch about the same quantity of fish a year. However, post-project one family’s catch might drop more than another’s, perhaps due to unequal impacts on the particular methods or gear employed or declines in one set of target species over another, meaning that they have been unevenly impacted in economic terms. Thus, they should be compensated for lost opportunity, food source and income on an individ-

an independent researcher a few months after dam commissioning (Shoemaker, 1998).

Extensive interviews of villagers in five villages during the present rapid assessment revealed that the river fisheries have continued to decline in productivity and ability to provide a viable livelihood option for villagers previously dependent on them. The researchers heard numerous accounts during both formal interviews and casual conversations about how the river fishery and associated wetlands had changed both qualitatively and quantitatively over time, with questions tending to focus primarily on the changes over the last decade. In many cases, villagers were able to give detailed accounts of pre- and post-dam catch trends, but determining economic losses was more difficult as the Lao kip has devalued so much in the past decade and because most villagers previously only fished for subsistence purposes.

TABLE 1. Local names of fish species reported to have increased in numbers, decreased in numbers, disappeared or newly appeared in the Nam Hai – Hinboun rivers since start of THHP

Village Name	More common	Less common	Disappeared	New spp.
Ban Nong Boua	<i>pba wian fai</i>	<i>pba nang, pba eun</i>	<i>pba jad; pba geng; pba khao sai; pba men; pba keng</i>	<i>pba non jan</i>
Ban Xang	<i>pba khae</i>		<i>pba hoo mat; pba nang; pba yang</i>	<i>pba eun; pba lai</i>
Ban Thonglom	<i>pba nai;</i>	<i>pba jad; pba geng; pba ga-juan</i>	<i>pba geng; pba boo; pba hak guay; pba gouan; pba phone; pba men; pba do</i>	<i>pba lai fai faa</i>
Ban Kongphat	<i>pba sagang; pba nang; pba lien fai; pba nai; pba khae; pba khao</i>	<i>pba jad; pba nang; pba grajai; pba lad; pba pia; pba kaew gai;</i>	<i>pba gae dam; pba ngu sing; pba hak guay; pba gaa; pba guan; pba men; pba do</i>	<i>pba fek</i>
Ban Tha		<i>pba hak guay; pba phone</i>	<i>pba khoon</i>	<i>pba nyawn</i>

ual household basis for actual losses suffered, not some average or supposed amount of loss based on guesswork.

The project’s impacts on fisheries and collection of LAR, as related by villagers, may be summarised as follows:

- Loss of fishing boats, equipment and gear from unpredictable rise and fall of water levels and variation in flows. No compensation was offered for lost boats or fishing gear, apart from villages located upstream of Ban Thonglom during the first year of operation. Villagers still feel let down by this, as many detailed their losses to company staff and had hoped that there would be follow-up.
- Catches have declined in all villages from pre-project levels, starting with a sudden drop in the first year in all villages (with the exception of Ban Kongphat which experienced a temporary improvement in catches, perhaps because fish moved upstream from the Nam Hinboun to escape the strong flows and turbid conditions) and then a gradual declining trend ever since.
- Fish migrating upstream from the Mekong have been confused by the change in water flows and turbidity, some of them coming earlier or later than normal or not at all.
- Villagers who once were able to fish semi-professionally lost their main source of income, while all families who previously ate fish at virtually every meal started to eat less fish. The most common response of what they ate instead of fish was “bamboo shoots”, although on closer examination some switched over to other forms of wild animal protein, such as rats, small game,

birds, bats in some villages (e.g. Ban Thonglom) and insects.

- Deep pools which previously had been the most important fishing sites in the dry season started to fill up with sediment. Many pools in the limestone karst gorge section, between Ban Kengkhot and Ban Thonglom, which previously had supported an important pools-based fishery for villages located upstream and downstream rapidly declined in productivity and ceased to attract fishers from other villages. “*Pba bor mee bon yuu asa?*” – meaning “fish have nowhere to live now”, is a common explanation for the decline.
- The water became much more turbid, leading to a crash in certain invertebrate populations near the bottom of the food chain, such as various species of mollusc, shrimp and certain aquatic insect species; while aquatic weeds (macrophytes and periphyton species) and turtles also disappeared. Villagers relate these disappearances to the turbid water and see a link between these being food items for fish and the decline in fish catches.
- As the river flow pattern and turbidity changed, villagers said that some fish species declined or disappeared, some increased in numbers and some new species were found (see Table 1 above).
- As erosion increased, so many marginal shrubs and bushes started to get washed in or inundated and die due to higher water levels. Bamboo, *gok kai* (a common willow-type bush) and many other types of riparian tree species were washed away. Villagers said these plants and their trailing roots or thick branches used to be fish refuges where villagers could go with



Boys show their haul of grasshoppers.

scoop nets and catch small fish hiding underneath. They also said that fish used to spawn in the root systems, but when the water regime changed and the habitats were lost or altered, they were no longer able to spawn.

- The water in the Nam Hai and upper Nam Hinboun downstream from the confluence has become cooler, especially in the cold season, due to the temperature differential of the Nam Theun waters. Villagers say this may be why the fish moved into the Nam Hinboun upstream of the confluence to find warmer and clearer water, like before the dam.

The depth of understanding by villagers about the fisheries changes, like the flooding phenomenon, is actually more complex and profound than expressed here, but more time would have been needed to record it in detail. The crucial point is that fishers live by the river, they observe its moods and signs, they know where particular fish are likely to be lying at any particular season and are acutely aware of changes that occur, both in the short and long term. Hence, it is not surprising that villagers know intimately what has changed on their river and through local inter-village networks, many are now familiar with how the Nam Hai has fundamentally changed and impacted the entire Nam Hinboun river system downstream. Unfortunately, this massive body of knowledge on the Nam Hai and Nam Hinboun rivers has not so far been tapped, missing a major opportunity for local learning and potential problem solving.

Because of the known importance of fisheries and LAR in the diets and livelihoods of local people, the issue was from an early stage in operations seen as one worthy of further attention and study by THPC. From December 1997 to December 1998, a fishery specialist was hired by THPC to conduct a fisheries monitoring programme to assess the project impacts on fish populations and to reduce adverse impacts by developing mitigation measures (Warren, 1999).

This report highlighted a number of fundamental impacts and issues not originally predicted, making several critical recommendations, but the reaction of THPC was to suppress its public release, eventually obliging the author to release a summary of the findings at an international conference in Sydney, Australia in June 2000 (Pahlman, 2000).

When the Logframe to implement the MCP was completed in 2001, fisheries mitigation was viewed as an issue of importance, although the approach recommended was to develop “Measures to provide protein replacement opportunities through improved livestock or fishery management” (p. 3 Logframe Summary). EMD also instigated a review of environmental and social impacts of the Project on aquatic life and fisheries between 2002-04 (Schouten et al, 2004). This review confirmed that fish yields in the Nam Hai and Nam Hinboun downstream of Ban Kongphat had declined significantly after the project. In one project village, Ban Thonglom, it was estimated that the impact was as high as \$363 per household per year.

Furthermore, the Schouten report stated, “After the Project, households cannot harvest aquatic vegetation or collect snails, mussels and shrimps from the Nam Hinboun mainstream. Food sources for fish declined as a result of impacts to the aquatic food chain, and thus fish productivity declined.” While this report confirmed what villagers had been claiming all along, it did not galvanise THPC to start providing meaningful compensation for the lost food and income opportunities suffered by some 5,430 families living in villages wholly or partly reliant on Nam Hai-Nam Hinboun river aquatic resources.

From the present study, it is apparent that nearly all families previously relied on the other LAR which have disappeared almost entirely as a food source during the dry season, when fish were relatively more scarce. The researchers ascertained that when these basic food sources were lost

and fish became scarcer after the dam, then villagers were faced with new difficulties in finding alternative types and sources of replacement food. Some switched attention from the mainstream river to other nearby water bodies, such as streams, fields and floodplain ponds, which all became more heavily fished as a result. Villagers also started to more frequently catch and eat other protein-rich food items, such as rodents, bats, small game, insects and birds, while consumption of bamboo shoots and wild vegetables are also reported to have increased considerably since 1998.

3.7 Village specific impacts and other local issues

This section considers each village by turn and looks at some of the changes and impacts experienced by the inhabitants over the past decade, both directly and indirectly project-related but not specifically covered in the above sections, plus other local issues of concern to villagers.

3.7.1 Ban Tha

Ban Tha is a village of 96 households situated next to the Nam Hai 8 kms downstream of the power station tailrace, and thus experiences rapid fluctuations in water level and flow when the turbines are switched on and off in the dry season. In 1994, it had 55 households.²⁴ The growth in population is from both natural factors and in-migration during the last five years. The greater population has inevitably increased pressure on natural resources locally, including aquatic resources and land for agriculture. The

village is electrified and lies about 2 kms off the new ADB-financed all-weather road from Ban Nahin to Konglor Cave. The road into the village is little more than a dirt track and is difficult to negotiate in the rainy season, when it gets churned to a sea of mud.

The villagers at Ban Tha and the nearby smaller Ban Thamtem on the opposite bank used to be able to cross the river easily in the dry season to reach fields or natural resources on the other side. The river stopped flowing in the dry season and shallow wells in the river bed became a source of domestic water. Fish and aquatic resources could be caught in both stagnant pools in the Nam Hai and a number of seasonal streams nearby the village. Once the Project started, the main impacts have been on erosion of land, aggravated flooding, loss of rice productivity and declining fish catches over time. Quite a few families have lost land, for which they have been paid no compensation to date. The river has increased in width substantially and in some places is 40 – 60 m wider than its pre-dam width, causing riverbank gardens, rice fields, tobacco plots and fruit trees planted by villagers to be lost.

The current headman was originally under the impression that villagers would be compensated at a flat rate of \$3,383 per family for land and riverbank gardens lost to erosion. He clearly remembers this exact figure, as it was written down in a letter from THPC, which was lost during a period when he was not the headman. He feels upset about the fact they were not paid this money, as he even announced it at a village meeting, thus raising everyone’s hopes that they would be compensated. But in the end, no compensation was paid and the village was just offered general assistance through EMD projects like the replace-

²⁴ The data is from Table 1, p. 10 in the MIDAS/Burapha Final Report on Rural Development and Landuse for the Norplan A.S. (1995) EIA. In the table, Ban Tha is denoted by its alternative name of Ban Kang.

«*Nyom! Bor mee pba leua!*
– I accept defeat! There are no fish left!»

ment vegetable gardens, wells and livestock vaccination. He also feels let down by the number of times that he and other villagers have given information and assistance to the Company staff or consultants, only to hear no more from them. It gets the villagers' hopes up that there is going to be some proper compensation, such that now villagers have become "bored" by the whole game and are reluctant to cooperate any more with THPC. The villagers also feel hurt when they hear from the Company that the villagers are to blame for the failure of the *Suan Theun-Hinboun* and that they (the villagers) are "lazy". "Was it the villagers who caused the flooding and caused the fruit trees to die?" they asked.

The headman said that in his opinion, the priorities for THPC to solve the village's problems should be as follows:

1. A clean and reliable water supply to the village – water is a basic need
2. Provide irrigation for dry season rice to solve the problem of rice deficiency and compensate for lost production caused by floods and erosion
3. Provide a safe and convenient place to live, above the flood level

Another issue which the headman had raised several times with EMD staff, but had never been followed up on, was repairing the dam behind the village on the Huay Leuk stream, which was built back in 1998 or so as a compensatory gesture for lost fish production. Inspection showed it to be rather poorly built, with most of the excavated soil for the dam coming from the downstream side of the dam, thus unnecessarily minimising the actual area and

volume of the reservoir itself. When floods come, the dam overtops at each end of the crest, causing scouring of soil from the back downslope of the dam. In late May, the reservoir was little more than a shallow puddle stretching upstream for a few hundred metres in a narrow gully between overgrown banks. While EMD stocked the stream last year with about 1,700 fish fry, this was the first time in several years that any stocking had taken place. The headman wants the Company to fix the dam as promised and improve the reservoir.

In the last four years, many villagers have started tobacco cultivation in the dry season, on fields subject to erosion along the banks of the Nam Hai. They can get credit easily to buy irrigation pumps, pipes, spraying equipment, a drying oven and other essential inputs like fertiliser and pesticides. It is contract farming, supported by government agencies, through one of several companies. Some villagers have made a reasonable profit, while others have made a loss. It is high risk farming, where nearly all the risk is borne by the farmer. Some villagers spoken to are heavily in debt, while others want to get out while they are just ahead. A new crop being extended to farmers is the native biofuel crop *Jatropha*²⁵, which some villagers told us they had paid out 70,000 kip to an agent to join a planting scheme, but had not heard anything back for a long time.

3.7.2 Ban Kongphat

«*Nyom! Bor mee pba leua!*» – "I accept defeat! There are no fish left!" – Words spoken by a Ban Kongphat fisherman the author met walking home early one morning after setting 25 baited hooks the previous night and not catching a single fish.

«The temporary rice surplus of five years ago has now turned into a serious rice deficit.»

Ban Kongphat, situated about one kilometre upstream from the Nam Hai – Nam Hinboun confluence, presently has 44 households compared to 35 households in 1995 (Table 3.4.2, Schouten, 2004). Because of its location, it experiences a marked backwater effect from the water releases into the Nam Hai, which thus regulates the water level in front of the village. During the dry season, if both turbines are switched on after a period of stoppage, this causes a pronounced backflow effect whereby turbid water in the Nam Hai will flow back up the Nam Hinboun from the confluence past Ban Kongphat, causing the villagers to experience dirty water conditions the same as all the other villages downstream. This backflow and backwater effect has also caused all the formerly deep pools to shallow up and become filled with sediment. With them went most of the edible shellfish, shrimp and aquatic weed the villagers used to harvest and eat. Experienced fishermen said it is the same now for the next 5 or 6 villages upstream, and one has to go up to near Konglor Cave before one starts to find deep pools which still have plenty of fish in them in the dry season.

According to village elders, the most important issue for villagers these days is worsening flooding, causing them to lose rice paddy production (see Box 2). This has caused them successive crop failures and they directly link this phenomenon to the dam operations, in particular the increased turbidity of the water as it picks up sediments in the Nam Hai (the villagers' *naa bee* were formerly located on the floodplain between the Nam Hai and the Nam Hinboun). They have now had to abandon the *naa bee* since disastrous floods in 2005 wiped out that year's crop, even though they formerly got good yields there due to fertile soils. They have moved rice production to higher, less fertile soils which require a lot of labour to clear and convert. This task is very difficult for young families with little labour or money to spare for mechanical clearing and so for the moment they mostly have to make do with prac-

ticing *hai* (upland rice), and accepting low yields. RMR (2006) recorded that 20 ha of *naa bee* had been abandoned in 2000 (see summary of estimated losses in Annex 2), but this figure is almost certainly on the low side, since more fields have been abandoned since. It also raises the interesting question of how long the new area of *naa bee* will be able to sustain continuous cultivation, now the surrounding forest (and main source of nutrients) has been lost. Villagers' livestock assets have declined since the project started, as many villagers were obliged to sell livestock to buy rice to eat, and so no longer have a potential source of manure to replace soil fertility.

Since 2002/03, Ban Kongphat has been provided with a dry season rice irrigation system (*naa saeng*) by EMD. This diesel pump irrigation and earth canal system is able to irrigate 11 ha of land that were formerly *naa bee* to the west of the village. 35 farmers have *naa saeng* plots, of whom 14 are from Ban Kongphat and 11 from Ban Na Phouak. In the first year of cropping, the villagers were astounded at the productivity and some families managed yields of up to 8.7 t/ha, which was previously unheard of in the area. They were given much help and assistance in the first year by EMD, including farmer-to-farmer training and heavy subsidies for fuel for the pump, fertiliser and pesticide and a Savings and Credit Fund was launched with close supervision from project staff. Not surprisingly, villagers were very happy and were able to sell the rice surplus and buy hand-held tractors and other items they had never owned before. Some families were tempted to buy electronic items like televisions in the belief that they would soon have power connected to the village. However, after that first year of bumper harvests, the yield has declined steadily in each subsequent year, until this year the average was around 1.8 – 2.3 t/ha. While input costs have increased in the last few years, the fuel and fertiliser subsidy from THPC has declined from 100% to 50%, with no guarantee of future support. At the same time, villagers have been sinking into debt

²⁵ *Jatropha curca* is a plant common in Lao villages that produces seeds with a high oil content, which can be extracted and used as a biofuel in diesel engines. It is currently undergoing something of a boom in production in both Laos and Thailand.

BOX 5. Tobacco cultivation – the new hope for the upper Nam Hinboun?

Over the last three or four years there has been a boom in tobacco cultivation in villages along the upper Nam Hinboun and Nam Hai basins, including Ban Tha and Ban Kongphat. Villagers were approached through agents for one of two tobacco companies – “A Daeng” (based in Vientiane) and “Dawg Mai Daeng” (based in Savannakhet). The villagers are offered a package whereby they are provided with large loans from the company and the Lao Bank of Agriculture under a contract farming system. The villagers must invest in many capital items, the most expensive of which is the irrigation pump and drying shed, which costs about 8,000 THB (US\$255). The villagers buy seeds, fertiliser and pesticide from the company, which they apply according to advice offered by the agent. When the tobacco plants have pest or disease problems, the agent supplies them with an appropriate pesticide for sub-

sequent application. The farmers claim they use masks and gloves when spraying, but others complain about the bad smell of the pesticide and packets of chemicals floating down the river. The farmers say they have to spray “often” to fight the pests.

If all goes well and they get a good yield farmers can make several million kip profit on the tobacco crop, but in the last year many people suffered large losses (up to 10 million kip or \$1,000 approx) because of low yields due to disease and complaints by farmers that the leaf grading system is “unfair”. They say that the agents only put a small percentage of leaves in the top grade and put everything else in the lower grades, which attract very low prices. Many farmers feel cheated, especially by the *Dawg Mai Daeng* company and want to get out of tobacco, even if it means making a big loss.

with the Savings and Credit Fund, for both covering costs of *naa saeng* and to borrow rice since the last two years of bad flooding and crop losses. The temporary rice surplus of five years ago has now turned into a serious rice deficit.

Villagers attribute the declining yields to lack of training and extension follow up (no more farmer-to-farmer training which was popular in first year); sub-optimal application of fertiliser and pesticide; disease and pest build-up; problems with water delivery system (siltation) and pump breakdown or stranding during low water²⁶; and general loss of confidence of villagers. As a result, poorer families have started to drop out of the scheme and have returned to relying on *hai* and poorly cleared, infertile *naa bee* for rice production, which is insufficient for their needs. Some farmers have tried their luck with dry season tobacco, but this is high risk contract farming, and due to poor yields and disease problems in the 2006/07 dry season, many have made a loss and are now in debt. Ironically, when farmers switch to tobacco, it is so labour intensive they often have little time to look after their rice crop, and this too has led to rice yield falls for some families. For the last few years, out-migration of young people to Thailand has started to occur, as economic opportunities dwindle in the village.

Another issue close to the hearts of Ban Kongphat villagers is the lack of electricity. In 2000, a state concession

company from Thakek arrived and started laying concrete poles through the village. The low voltage line was going to provide electricity to Ban Kongphat and seven other villages lying downstream. The company cut down all the valuable hardwood timber trees along the route and took them away, apparently as part of its concession. In the village itself, villagers were asked by the company staff to cut down all the fruit trees in front of their houses, so the company could easily lay poles and connect the power supply. It was on a traditional rest day for the village, when it was considered taboo to work, and the villagers asked to postpone the cutting to another day, but the company insisted it must be done right away. The villagers reluctantly agreed and set about chopping down many old and productive fruit trees which they had nurtured from seedlings, so they could finally get the electricity that they had been waiting for ever since the dam was built. Unfortunately, the concession company went home a few days later and never connected the power line, and despite repeated pleas to government and THPC officials by the villagers over the last seven years, they are still without power.

The spectre of resettlement as a result of THXP is now starting to concern villagers. While they would much prefer not to move, the flooding seems to be getting worse each year, so they think it may be necessary if a new dam is

« ...despite repeated pleas to government and THPC officials by the villagers over the last seven years, they are still without power.»

built and more water diverted. Already one family (relatively wealthy) has moved up to the new ADB road and built a new house, but others are reluctant to move until they know exactly what they will be entitled to in terms of compensation. That has not been spelled out yet by THPC officials, so in the meantime the villagers are sitting tight and those that can afford it are storing some timber under their houses for a possible future move. The potential relocation site is not completely flood immune and with the new road affecting drainage patterns, there is a danger that it too could be subject to aggravated flooding.

3.7.3 Ban Thonglom

Ban Thonglom is situated at the southern end of an impressive long limestone gorge through which the Nam Hinboun flows, some 36 kms downstream from the tail-race. Its present population is approximately 453 people living in 72 households.²⁷ Villagers in Ban Thonglom were



Ban Thonglom *naa sak* method.

formerly heavily dependent on fishing and before the dam fish were always abundant in the pools lying upstream of the village towards Ban Khen. This fact was exploited by other villagers living upstream and downstream who came in the dry season to fish the pools and take back home dried and fermented fish (*pba daek*) to consume or barter for other goods. The village, because of its situation and relative isolation from other villages, could be considered rich in natural resources.

Following the construction of THHP, the villagers started to notice their village became subject to more frequent and severe floods. The water tended to be deeper, stay for longer duration and be more turbid than before. People told us that pre-dam the rice fields would experience severe floods once every four or five years, but since the dam, they have been annual events. 2005 was the most severe flood in recent years and caused most families to lose their crop. Several people told us rice production in the village had declined by more than half since the dam was built. Despite the risks of floods, the villagers of Ban Thonglom have persisted with *naa bee*, unlike many other villages which have abandoned their fields en masse.

Villagers know it is critical to get the rice plants as high as possible, so in a “dry” year like 2007, when the rains have arrived late and water was not yet standing in the *naa bee* during our visit, they practice *naa sak* seedling nursing, as a way to hasten the growth of the seedlings (see photo below left). This method is labour intensive, but if they waited any longer they run the risk that the small seedlings would be inundated by the first floods of the year, which may come as early as July or as late as August. By comparison, the researchers came across quite a few villagers adopting another method of risk-avoidance which was less

²⁶ The water pump used to be located over a deep water pool, but with time this has silted up and is now shallow. Hence, when the power station shuts down turbines and water level falls, the pump raft gets stuck on a sandbar and cannot be moved. At night this is not a problem as it will float again in the morning, but if the power station closes for 2 – 4 days during the critical rice growing season, this can cause water shortages to the crop, leading to yield declines. If THPC announced the closures, then the villagers could take advance action to put the raft over deeper water, but often they are not forewarned.

²⁷ This data was taken from Table 21.26 of RMR, 2006

« ...most people admitted they did not understand the implications and were afraid to ask questions.»



Ban Thonglom ploughing and direct seeding.

costly in terms of labour, namely direct seeding (see photo above). Direct seeding after just one ploughing has the advantage of being cheap as no intensive labour inputs are required like *naa sak* and transplanting, but its disadvantage is that germination rates are likely to be relatively low. Villagers were adopting this method for the first time this year, having heard it had worked well in neighbouring Ban Fangdaeng last year.

Apart from the loss of rice production, floods cause problems in the settlement of Ban Thonglom itself. Flooding around the houses causes big problems with finding food for people to eat; for livestock (like pigs, goats and chickens) to eat; access problems to and from the village or fields; for drinking water as the wells and springs become contaminated and lastly for public health – people are more prone to illness during floods and foot sores are common ailments.

The prospect that the village will be forced to tolerate deeper and longer flooding if THXP goes ahead does not appeal to villagers. However, until they know exactly what

compensation they will be entitled to, if they did have to relocate, nobody wants to say if it will be a good thing or not. So far THPC staff have held two meetings about THXP with the village, but most people admitted they did not understand the implications and were afraid to ask questions. A poor respondent told the researchers that relatively wealthy villagers had different reasons for relocating than poorer villagers. For example, they have been told they would get electricity at their new site if they moved, which more wealthy villagers would not mind paying for, but poor villagers like himself fear they would not be able to afford electricity, so it would only be an incentive to move if it was guaranteed that connection to the grid was free.

In fact, the issue of electricity connection is a contentious one. According to villagers we spoke with, a company arrived in 2001 and laid concrete posts to Ban Thonglom and neighbouring Ban Nakhok, and in return took away the valuable timber lying along the route (and much besides, according to some). The understanding was that the electricity cables and power would soon follow, but six years later they are still waiting. Some villagers who got bored of waiting and can afford it have now turned to solar. They pay a monthly fee to a company and have fitted a single small solar panel, which is sufficient for a few light bulbs around the home.

Ban Thonglom, of the five villages the researchers visited, was the only one that seemed to have an active alternative economy running, which didn't primarily depend on agriculture or harvesting of aquatic products and NTFP's as its basis. There was plenty of evidence of an active business in timber extraction on-going, including several logging trucks and a house rented to a Vietnamese logging company. We were informed by the village headman that this company had a contract to supply timber for "building houses for the Nam Theun 2 Project". This came as some surprise, given that the Nakai Plateau until recently had some of the health-

BOX 6. Oji plantations in Laos – smash and grab industrial forestry for the 21st century? (Source: Barney, 2007)

Oji-Lao Plantation Forestry Ltd. is a joint venture plantation project between Japan's Oji Paper Ltd., holding an 85% stake, and the Government of Laos (15%). Oji Paper entered into the venture in December 2004, with a takeover of the New Zealand BGA-Laos Plantation Forestry Ltd. BGA had originally secured the concession lease agreement with the Government of Laos in 1997. BGA was a recipient of approximately US\$1 million of subsidised loans through the Asian Development Bank Lao Industrial Tree Plantation Project (ITPP). Upon takeover of the BGA project, Oji-LPFL has paid off the full principal of the original ADB financing package.

Oji Paper are reported to be seeking to export 450,000 BDT's (bone dried tonnes) of eucalyptus woodchips per year from Laos, apparently to support a new integrated pulp and paper mill it is building near Shanghai, China. In Laos, Oji-LPFL holds prospecting rights to locate up to 50,000 ha of plantation, within a 154,000 ha concession area of Pakkading District, Bolikhamsay and Hinboun District, Khammouan Province. It pays just \$6-8 per ha per year for the land it plants, under the state lease agreement. It has established a nursery and office in the village of Ban Song Hong, near the Route 13 bridge across the Nam Hinboun and has built up close links with district government officials. Its planting target was 4,000 ha in 2006, and will be 7,000 ha per year in subsequent years. The company is keen to project a positive image about its operations in Laos and is reportedly preparing an FSC forestry management certificate programme and is considering applying for Clean Development Mechanism carbon credits.

While the company states that it only plants on "lands degraded by slash-and-burn farming... and spontaneous recovery is hardly expected" and "Unless this project is implemented, illegal slash-and-burn farming will continue by the locals, who have no other means to secure food", the situation on the ground is more complex and disturbing. Evidence gathered from this study and that of Barney (2007) in the village



Land newly converted to eucalyptus plantation.

of Ban Pak Veng (between Ban Nong Boua and Ban Xang), shows that the Oji eucalyptus plantations are systematically overtaking areas of healthy and recovering secondary forest, which is extensively used by villagers for gathering a range of NTFP's and for swidden agriculture (*hai*). These forests, along with the river and wetlands, form the basis of the villagers' livelihood and food security system. Furthermore, as the wet rice paddy fields have become unproductive due to dam-aggravated flooding, villagers have been forced to rely more heavily on swidden agriculture for rice production, even though it is technically illegal in Laos. Yet, at the same time, due to the Oji-LPFL removing up to one third of village land out of production, villagers are now faced with a much diminished and depleted area left to grow rice or collect NTFP's. In return for the concession, villages are entitled to \$50/ha compensation over 50 years, although this sum is not paid in cash. The favoured payment method has been the construction of raised earth roads, from the Route 13 highway into the village, without bridges or culverts to prevent washouts at streams and ditches. Villagers have no way of knowing how much the road is worth or whether it is worth the loss of their forest resources.

iest timber resources in Laos. It is clear that some families in Ban Thonglom have benefited financially from the logging business and there were signs of wealth not apparent in other villages, such as motorbikes. However, it cannot all have been as a result of logging income, and another perhaps more lucrative recent source has come from young people, especially girls, going to work in Thailand. There are now at least 30 – 40 teenagers working in Thailand, and some seem to make enough money to motivate more to go.

Ban Thonglom, unlike most other villages along the Nam Hinboun, chose after the MCP was implemented to take compensation for riverbank vegetable garden losses over

an EMD-assisted *naa saeng* or irrigated vegetable garden. They figured they would be given money when they opted for compensation, but in the end it was delivered in rice between 2000 – 2004, according to the headman. Actually, the village used to cultivate *naa saeng* between 2000 – 2002, with the help of a DAFO pump, but it was given to another village after the villagers failed to make a profit from dry season rice. They tried growing maize last year, using a pump supplied by EMD, but that failed too, due to insufficient water and low market price. As a result, the village has not adopted more than a few of the MCP interventions and these did not seem to have been enthusiastically embraced, with the possible exception of the medicine cabinet

and the livestock vaccination programme, which respondents thought had helped reduce livestock disease.

The final issue which will affect future prospects for Ban Thonglom and its neighbouring Ban Fangdaeng concerns their recent decision to allow the Japanese company Oji-Lao Plantation Forestry Ltd. to establish a eucalyptus plantation on 175 ha and 425 ha of village forest land respectively. During the past dry season, bulldozers belonging to the company have been busy flattening and burning the forest which was formerly used as an area for collecting NTFP's and growing upland rice. While the researchers were in the village, the company was hiring villagers to fence the land off for imminent planting with eucalyptus seedlings. Villagers have not yet realised it but they will soon be excluded from their own forest (see Box 6).

3.7.4 Ban Xang

Ban Xang is a small village of 43 households on the west bank of the Nam Hinboun, about 61 kms downstream from the power station tailrace. Villagers have long been dependent on a mix of rice cultivation; fishing and collecting LAR; and collecting NTFP's. The village is about 6 kms from Route 13, but until recently was not connected to it by more than a track, and most travel was up and down the Nam Hinboun by boat, with the nearest market being located at Ban Song Hong. Villagers were too far away from the market to deliver fish daily, but in the past fish traders from Ban Song Hong would come upstream and buy fish from the villagers. However, this trade slowed down after the dam was built and more or less dried up a few years ago, apart from during peak migration periods.

Since 1998, the main problems experienced by villagers have been changes in flows and flood patterns in the wet and dry season; loss of riverbank vegetable gardens; more turbid wa-

ter making it dirty for use and killing rice plants; decreases in rice yields following abandonment of *naa bee*; significant decreases in fish and LAR catches; and periodic livestock epidemics which can kill many head of cattle and buffalo in a short period of time. Like in other villages visited, it was the impacts of flooding on rice production which most concerned villagers. Pre-dam serious flooding occurred once every three or four years, with the villagers storing rice from the good years to see them through the odd poor year. But since the dam was built the flooding duration has become more prolonged and rice harvests have declined accordingly. Households have gradually given up planting wet season rice and moved to planting lower yielding upland rice plots, especially after serious flooding in 2005.

According to the village headman, 50 ha of *naa bee* on the east bank and 20 ha of *naa bee* on the west bank have been abandoned since the dam started operating. In 1998, the District Agriculture and Forestry Office (DAFO) provided an irrigation pump, which allowed the villagers to plant *naa saeng*, which they have practiced ever since as partial compensation for lost *naa bee* rice. However, it is only a limited area (19 ha) and he pointed out that it cannot compensate really for lost *naa bee* production, as *naa saeng* involves expensive investment costs, while *naa bee* involved only the cost of ploughing. In 2002, THPC took over responsibility for supporting the *naa saeng*, as DAFO were having difficulties fixing the pump in a timely manner when it broke down. In the first couple of years after THPC gave support yields were good, but they have declined in the last two years. He is not sure why, but thinks it may be to do with applying less fertiliser than before and build up of disease.

There are now 33 families involved with growing *naa saeng*. The average yield is now around 1.9 t/ha, compared to 3 – 4 t/ha during the first two years of EMD support. Only the comparatively more wealthy families can afford to practice *naa saeng* cultivation, because of the overheads

«Overall, the village has changed from a position of rice self-sufficiency to one of deficiency during the last decade.»

involved. The costs of fuel and fertiliser are subsidised at a rate of 50% by EMD, with the collected sum going into the Village Development Fund. Villagers must repay their loans to the S & C Fund at a rate of at least 5,000 k (i.e. approx 50 cents) per month to stay eligible to borrow from it. However, some villagers interviewed are now in debt to the fund. For example, Mr Boonleum (45 years old, family of six) suffered a poor harvest in 2006-7 dry season due to pest damage and is now in debt to the Fund for 900,000 k, with no immediate hope for repayment as he needs all the money he can get to buy rice for his family until he harvests the *hai*

(September/October). Even then, it is unlikely he will have surplus to sell, so he will quite likely have to drop out of the *naa saeng* scheme, unless THPC forgives the debts.

Overall, the village has changed from a position of rice self-sufficiency to one of deficiency during the last decade. Villagers are convinced that the primary cause is altered flooding patterns as a result of THPC water releases into the Nam Hai-Hinboun rivers. When asked how villagers were coping with the rice shortage problem, the headman told us they were now doing day labour jobs to earn money to buy rice,



Ban Xang *hai* expansion.

BOX 7. *Suan Theun-Hinboun* – Replacement plots for lost riverbank vegetable gardens

Loss of dry season riverbank gardens were one of the first impacts felt by local people in all villages from Ban Nam Sanam near the power station down to the confluence of the Nam Hinboun and Mekong (Shoemaker, 1998). While Project consultants in 2001 estimated that average economic losses over four years from lost garden areas and crop production were \$139/household for 2,208 households in downstream villages, THPC chose only to offer a small amount of rice to households in compensation (RMR, 2007). Following implementation of the MCP Log-frame, its main compensatory measure was the establishment of irrigated river terrace gardens on common land as replacement areas for villagers to grow vegetables. EMD helped clear the land, providing food for work, and initially provided a diesel pump, fuel, pipes, storage tanks for each household, fencing, seeds, fertiliser,

fruit trees and other minor inputs. The concept was that after a few years' extension and support, the fuel and maintenance subsidy for the pump would be withdrawn and the villagers would be able to pay for these things themselves through income from vegetable sales.

These gardens were at first enthusiastically taken up by most villagers, who thought that they would be more convenient than the lost riverbank gardens and they would have surplus to sell. Unfortunately, EMD paid little attention to the matters of markets (or lack of them in most villages) and the labour shortages in most households for such tasks as weeding and watering, when the villagers are busy with multi-faceted livelihood systems. There were also problems with fence maintenance (essential against

wandering livestock); pump maintenance and other tasks which required communal cooperation. Whereas with the *naa saeng* there was a clear economic incentive to make it work, that link was not so clear with the Suan T-H and in many villages the system has started to break down (Ban Kongphat, Ban Nong Boua and Ban Xang) or be abandoned altogether (Ban Tha and Ban Thonglom). Another factor which hastened the demise of this development intervention in several of the villages was the death of project-donated fruit trees from flooding; poor follow-up and extension; and lack of market support for villagers. While in Ban Nong Boua the villagers still have most of their fruit trees, this was the only village where the gardens looked relatively well-kept, perhaps because there is a market not so far away for the vegetables at Ban Song Hong.

such as working on the Oji plantation or clearing vegetation for rubber plantations in villages near the Mekong. Some were planting more *hai* than before, but were constrained by lack of labour for this, especially as children now tended to study longer in school than before. Teenagers who drop out of education were now leaving the village for work and not available for on-farm work. Most were going to Thakek, Savannakhet and Vientiane but a few ("3 or 4 only") had crossed the Mekong to find work in Thailand.

When asked about various assistance projects extended by EMD under the MCP, the headman told us that the most useful had been the medicine cabinet which meant that villagers no longer had to go to Song Hong market to buy medicine, which saved them time and money, and the toilets, which he believed had helped reduce disease. When asked about the replacement vegetable gardens (*Suan Theun-Hinboun*) he said they had not been successful, because it was too much trouble for the villagers to upkeep when they were involved in other activities (like *naa saeng*) and there was not a convenient/nearby market for the vegetables, plus most of the fruit trees given by EMD had died from flooding (See Box 7). The researchers went out to inspect the gardens and found them mostly overgrown with secondary regrowth and *Imperata* grass. We could only see one plot which looked like it had received any attention from its owner in recent months and where a few fruit trees had survived the floods. There were signs that fire had swept through some of the area in the dry season.

According to data provided in the EIA (RMR, 2006), Ban Xang has suffered the highest economic losses of all villages surveyed, amounting to \$564.10 per household per annum (see Annex 2). This figure includes losses incurred from rice production declines, property and livestock losses, fishery

losses and riverbank garden losses, and would amount to an average family loss of \$5,076.90 over nine years. To date, none of these losses have been compensated for directly.

From the villagers' perspective, perhaps the issue which most concerned them during our visit was the presence of Oji-LPFL and its expanding operations locally. This issue was raised time and again in conversations with villagers, who were caught between a rock and a hard place. On one hand they are watching the forest, the source of much of their food and livelihood, being destroyed before their eyes, while on the other hand their impoverished economic circumstances caused by rice deficiency means they feel obliged to work for Oji-LPFL for a daily wage equivalent to about US\$2. For this they must work nine hours a day cutting undergrowth, making fences and planting eucalyptus seedlings. Children as young as ten or eleven years old are working in the plantations (confirmed by several villagers and headman).



Bamboo and fruit trees bulldozed in Ban Xang.

Oji has been given the rights in Ban Xang to plant 98 ha of forest land officially classified as "*paa lao*" (degraded forest) but which is in fact healthy, recovering secondary forest used for swidden cultivation and gathering NTFP's. The Company now has absolute rights over this land and can exclude villager access. In return for this 50 year concession, villagers were given a 6.2 km road to the village from Route 13. The road was actually supposed to extend into the village itself, but the company reneged on the agreement and stopped at the entrance to the village. This was not before an Oji bulldozer came in and cleared all the bamboo clumps and fruit trees in front of the villager's houses (see photo, right). Not surprisingly, villagers were very upset about this unnecessary destruction, and even though the village representative in the sub-district council had spoken out about this at meetings, his concerns were ignored by government officials whom he said were under the influence of Oji money. Furthermore, he had been told the villagers must not object to "development projects" as they were now the source of income for the district government, since the central government had been forced to cut back expenditure at the district level and wanted them to become more self-sufficient by working with foreign investors.

One particular issue concerns animal health and nutrition. When floods come in the rainy season the villagers take their cattle and buffalo to the forested hills towards Route 13, where traditionally they have been able to graze freely in the forest. But now Oji are converting those forests to fenced eucalyptus plantation and will not tolerate villagers' livestock trampling on their precious seedlings, and the abandoned paddy which acts as grazing land when it is not flooded is under threat of greater flooding, it raises a serious question over where will villagers be able to raise their livestock in the future? At the same time, several people

mentioned that in recent years there have tended to be more outbreaks of disease amongst livestock during floods and last year several cattle and buffalo died, whilst chickens were washed away.

When questioned about the proposed THXP and the threat of increased flooding, villagers understood, as a result of public meetings and an information booklet provided to households (see Annex 1), that the new dam would lead to stronger flows year round and more prolonged and deeper flooding in the rainy season. They said that they had discussed the possibility of moving and that if it was necessary, they would agree to move, with the proviso that they were fully compensated for all costs of moving houses and other infrastructure. When asked where they would move to, they thought the best place would be the edge of the hill on the road into the village. When asked about water availability at the site, they were a little less certain and said that water supply must also be provided by THPC. And replacement livelihoods? Silence at first, and then the headman answered, "Sure, it will be harder. Fishing and growing rice will be harder."

3.7.5 Ban Nong Boua

Ban Nong Boua, a village of 63 households, is situated 79 km down from the tailrace and about 11 km upstream by boat from the Route 13 bridge at Ban Song Hong. In the recent past, the life of the village revolved around the river, but since the dam was built and the road upgraded, those links have diminished.

The village is surrounded on three sides by the Nam Hinboun and a large area of paddy fields (*naa bee*), above which

« ...since 1998, most of the village's *naa bee* on the east and west banks have been abandoned.»

the village is marginally elevated. When flooding occurs, the *naa bee* are flooded and in serious years like 2005 and 1999, the floodwaters reach the lower lying houses in the village. During those periods, the only way in and out of the village is by boat and so it is seen as essential to have one. Despite this, some of the younger, poorer families cannot afford a boat and they suffer badly during the flood season, as they have to rely on the generosity of others for transport. Flooding is not a new phenomenon in the village, as confirmed by Claridge (1996), who stated, “Flooding occurs every year, and on average water is over the river bank for 7 – 8 days each year, though in a very bad year it might be as long as three months. Paddy is lost to prolonged flooding around one year in four. The impacts of flooding are not as severe here as in the other villages surveyed, possibly because of the different elevations available for paddy fields”. Thus flooding was a risk that people were prepared to live with, as the good years outweighed the bad, and there was no mention of people abandoning paddy fields. Yet since 1998, most of the village's *naa bee* on the east and west banks have been abandoned, due to the successive losses of rice crops and increased risks presented by flooding. Instead of 7 – 8 days being the norm for flood duration, now 15 – 30 days flood retention have become common.

In the THXP EIA, RMR (2006) have reported that since 1998, the minimum reported loss of rice crop was 70%, with 1998 and 1999 causing total losses, while 35 ha of paddy were reported abandoned in 2000 (Table 21.27). According to villagers we spoke to, the amount of abandoned paddy has increased since. One woman the researchers spoke with said she had lost three *rai* of rice plants in August last year, which was also the lost cost of ploughing, hiring labour for transplanting and rice seeds.

The villagers' way of coping with this reduction in rice harvest has been three-fold. The first has been to switch from *naa bee* to *naa saeng* production for the main rice

crop. The village was first supplied with an irrigation pump and canal system by Hinboun DAFO in 1996, but EMD took it over in 2002, and have subsidised its operation since. The irrigated area covers 24 ha, which is farmed by 52 families, with individual holdings varying between 1 – 6.25 *rai*. While *naa saeng* can yield up to 6 t/ha in a good year, around 2.25 t/ha has been more normal in the past couple of years when pests have been bad. The families not involved tend to be ones who have slightly higher elevation *naa bee*. The second coping mechanism has been extending the area of upland rice (*hai*) grown, but this option tends to be constrained by labour limitations and government policy. Increasingly, the options for cultivating *hai* are being reduced further by the rapid expansion of Oji eucalyptus plantations in the village's forests.

The Oji-LPFL relationship with villagers in Ban Nong Boua is not a smooth one. We heard from several sources that a 200 ha concession had been granted to the Company for planting eucalyptus without the full consent of villagers first, rather similar to the story in Ban Xang. According to a Deputy Headman of the village, the Headman and another Deputy were the only people involved in making the decision to sign over the land, which had been done without consultation with all the villagers. He said Oji had started planting two years ago, by first bulldozing healthy forest and then burning all stumps and debris in situ. Villagers who wanted to take out some of the wood before it was burnt were not allowed. The villagers regretted the Headman's decision, as they now saw what they had lost and it was too late. The villagers could now only work as hired labour at 20,000 kip a day or 25,000 kip/day if they sprayed pesticide. This is the third coping mechanism for villagers who are now rice deficient and need cash to purchase sacks of rice. Previously they could rely more heavily on collection of NTFP's to sell at certain times of year, but as Oji expands operations this livelihood option is rapidly dwindling too.

A group of villagers the researchers spoke with one evening said the impacts of the Oji plantation were worrying them. They said that in theory the company was only supposed to plant eucalyptus in degraded forest areas, but in fact it had planted in areas of primary and secondary forest which were fertile and productive. Naturally, they recognised the contradiction whereby government policy outlaws villagers cultivating *hai*, by labelling it destructive “slash-and-burn” farming, with strict punishments for offenders, yet facilitates a company like Oji to come in and clear cut then bulldoze every last bush flat, before setting fire to the lot. Now the eucalyptus trees were growing, villagers were being excluded from the concession area which was previously communal open-access land. Oji hired non-local guards to keep villagers and their livestock out. In the last rainy season, when grazing is limited because of the flooding, villagers took their cattle and buffalo to the hills to eat grass, but when they wandered into the Oji plantation, they were apparently shot at by guards. Some cattle had been lost last year, while some cattle and buffalo had fallen ill after grazing in the area of the Oji plantation during a time when they were spraying herbicide between the tree rows. When asked for compensation, company officials told the villagers that the pesticide they used was “livestock safe”, so it could not have been the cause.

Like the other villages which have granted concessions to Oji, the villagers have seen very little in return. Although they have been told that officially the rate for the village is \$50/ha for a 50 year concession, they are not paid this in cash but are given an access road without any bridges or culverts at watercourses. As the road has to cross one perennial stream which would be difficult to cross on many days following rain, a bridge is being built, but not from Oji funds. It is a real team effort, with THPC providing three support posts, Oji one support post, timber coming from the District authorities and labour provided by the villagers themselves. As the Deputy Headman told us, “The

road is poor quality. The road is not a fair swap for losing our land. The villagers have lost out, been cheated.”

Given this sentiment towards Oji and the Headman's actions, it was a contrast to hear some positive words said about EMD, whom most of the villagers we spoke to were relatively pleased with, as they were more responsive to villagers' requests and needs. The villagers reflected that the assistance projects had been quite helpful, in particular the *naa saeng* and *Suan Theun-Hinboun*. They liked the fact that the EMD staff consulted them directly, unlike Oji and BGA before it, which just went through the Headman for everything. The 62 year old father of the Deputy Headman said that THPC has helped villagers in many ways, and even given individuals fuel for their pump when they needed it. It was clear from the level of participation in the *naa saeng* scheme and *Suan Theun-Hinboun* (which were still operating), that these interventions were seen as relatively useful. The Savings and Credit Fund seemed to be popular, while subsidised toilets and water wells were still being used. The main area of concern was the impacts on fish and aquatic resources (see Box 4), which had not been compensated or mitigated for. EMD had given a pig each to two families, to be future breeding stock, but the animals got thinner and were eventually sold, so there was no benefit for anyone else. Other people were promised chickens and rabbits, but they were never delivered. One man told us he had paid for two fish ponds to be dug, but had no money to pay for fish to stock them and wanted help with fish fry and extension advice from EMD.

With regards to THXP, the villagers were informed about it through two public meetings and the information booklet. They understood that flooding would likely get worse, but did not think that they would have to be relocated. They thought that not all losses had been compensated for with the present dam, so hoped that if a new dam was built they could request fair compensation for their losses.

« ...as far as fishery damage mitigation and compensation goes, there has been little or no progress made... »

4 The Mitigation and Compensation Plan – how is it faring?

This section gives a brief overview, based on the researcher's observations and feedback from affected persons met in the field, on how the 10-Year Mitigation and Compensation Programme is performing in addressing the project impacts, six years into implementation. The first thing that must be borne in mind is that the MCP did not start implementation until mid-2001, over three years after the dam started operation. According to "Compensation and Mitigation Principles" laid down in the Logframe (THPC, 2002, p.2-3), THPC would be guided by "the ADB experience in involuntary resettlements", where, "issues that must be addressed include:

- Loss of income value (in cash or in kind) during the period between project impact and commencement of livelihood restoration measures (i.e. mitigation activities);
- The loss due to time delay in finalizing compensation; and
- The cost of measures that allow annual incomes and living standards to be restored to the same or better condition than those existing prior to the project impacts."

THPC did not intend to provide cash compensation to impactees, but would provide in-kind compensation, although admitted that it was difficult to quantify the actual costs of lost incomes and measures to restore affected people's livelihoods. THPC prioritized activities such as restoration of water supplies for domestic consumption and riverbank gardens; protein replacement opportunities through improved livestock or fishery management; and the creation of alternative income generation opportunities, such as silk production or NTFP promotion.

Using these priority areas as the basis of its intervention in impacted villages, EMD has been attempting to implement what can only be described as a conventional integrated rural development approach over a vast area, both in the Headpond villages and in the downstream Nam Hai and Nam Hinboun communities²⁸. It was obvious to the researchers that the MCP priority activities were failing to meet the needs and aspirations of the affected people, and with the exception of Ban Nong Boua, the EMD had ceased to be viewed in a positive light by the majority of the population who were suffering declining living standards. The level of success of each key activity area is briefly considered below.

i/ Restoration of water supplies for human consumption

While it could be argued that restoration of water supplies has been broadly achieved in the villages, it was noted that in May 2007 (start of the rainy season), many wells were lying idle and villagers were still relying on water from the river for much of their domestic needs. In fact, in all five of the villages there were complaints about the quantity or quality of the water in the wells, and it was obvious that the water was of inferior quality to the pre-project situation in the river, where the villagers still prefer to do much of their personal bathing and clothes washing. Many wells had hit rock or were too shallow and dried up in the dry season. Being next to the river, many wells were dependent on the river level, which fluctuates daily, and when the turbines are turned off, many wells dry up.

ii/ Restoration of water supplies for dry season gardens

After a few years of relative success in some villages, THPC's dry season vegetable garden program has now largely failed in the villages visited, with the exception of

« ...THPC's dry season vegetable garden program has now largely failed in the villages visited »

Ban Nong Boua where it is still being adopted by a reasonable percentage of villagers, but is not self-supporting and is highly vulnerable to external factors, including continual subsidy support by THPC for fuel and pump maintenance. The researchers noted a significant number of abandoned pumps in the villages and along the banks of the Nam Hinboun. Lack of a market for produce, extra labour required, pump breakdown, fence failure, crop disease and loss of fruit trees from flooding were amongst the most common reasons for failure cited. Furthermore, after regular extension visits in the first year when interest and motivation was high, the frequency of EMD staff visits appears to have trailed off in subsequent years, just at the time when problem-solving capacity was needed. As a result, when the systems started to fail the villagers were often blamed for the problems, which later caused ill-feeling between project staff and the villagers²⁹.

iii/ Protein replacement opportunities through improved livestock management

In the early years of the MCP, a "demonstration farm" was established to test new breeds of livestock for dissemination to surrounding farmers to replace lost fish in the diet and earn income. A Lao advisor was hired to study rabbit and goat breeding and assist with the field extension programme. However, by 2007 the activity would appear to have gotten little further than giving away a few improved breeds of pigs and chickens to a few households, who subsequently were unable to adequately look after them, plus a vaccination programme which is generally popular but not without serious problems. There were complaints by villagers about the costs of vaccination and the dedication of the village veterinary worker, who works on a semi-voluntary basis. While most villagers agreed that mass disease outbreaks had decreased over the past decade, this must be

weighed against reports of increased animal health problems and occasional drowning of livestock during flooding periods, which villagers associate with dam impacts.

iv/ Protein replacement opportunities through improved fishery management

Given the nature and severity of the impacts on the principal source of protein for local people, rapid attention to this issue was crucial. Yet as far as fishery damage mitigation and compensation goes, there has been little or no progress made (refer to section 4.1 for further details), which flies in the face of all recommendations made to THPC since before the dam was built. As a result of this absence of support, people have less protein sources than pre-1998 and are forced to exploit other sources, often in unsustainable ways. Attention has turned in many instances from the mainstream river to more intensive use of floodplain streams and seasonal waterbodies, plus greater consumption of wild animals and NTFP's, especially the ubiquitous bamboo shoot.

v/ Creation of alternative income generation opportunities

The researchers found no evidence that alternative income generation opportunities were being supported beyond the *naa saeng* dry season rice irrigation schemes, which has seen universal decline in yields ever since its first year. As a result, many households have moved from a situation of rice surplus to rice deficit in the past few years, at the same time as flooding has gotten worse and caused widespread abandonment of *naa bee* in all villages visited, with the exception of Ban Thonglom, where villagers are battling on against the odds. Therefore, the financial and management support sunk into *naa saeng* (which three years ago were viewed as the "jewel in the crown" of EMD's activities) has clearly not

²⁸ The Review of EMD pointed out that there were other villages clearly impacted by the THHP, but not at that stage adequately included in the MCP, if at all, specifically those along the lower part of the Nam Theun-Kading river in Pak Kading District and those that used the upper part of the Nam Theun-Kading and Nam Gnouang rivers which had suffered from declines in aquatic resources (Blake et al., 2004).

²⁹ In Ban Tha, the system is entirely abandoned now after just a few year's use. Villagers' claim that when problems appeared which needed joint solving capacity, the EMD staff blamed the villagers for the problems and accused them of "laziness".



A broken irrigation pump left high and dry.

paid off or proven sustainable in the long run. One obvious reminder of the growing failure of this programme are the sight of abandoned pontoon-mounted pumps along the banks of the Nam Hinboun (see photo above).

Concerns about this possibility were expressed in the Review of the Environmental Management Division (Blake et al, 2004), which stated (Main Findings and Recommendation, p.8),

“17. The dry season irrigated rice program has achieved impressive results in a short space of time. However, focusing on such high yields with heavy inputs comes with certain risks, should yields not be realized. The project may be spreading itself out too thinly on the ground by increasing the number of villages that it is working in before village support systems initiated by the project have matured.”

In particular, there was concern that resource poor farmers were in danger of being lost from the program because they were risk averse and could not afford the high level of agronomic inputs and debt required by the project. Inevitably, as input costs have increased, the level of subsidy from THPC has decreased from 100% to 50% (2006) to 30% (2007), and yields have steadily declined. There has

been a corresponding increase in debt to the Savings and Credit Fund, while the poorest farmers have gradually been withdrawing from the scheme. Amongst the “poor” families the researchers interviewed, the majority were either unable to afford to join the naa saeng scheme, or were now slipping into debt and were considering withdrawing. Some villages, such as Ban Thonglom, had been tempted to try maize (or corn) instead of rice in the last two dry seasons, as it uses less water and is a more economical crop according to advice provided by EMD staff, but villagers we spoke to who had tried it reported that yields were disappointing and prices low. Profits were small for most, some had fallen into debt and were loathe to try maize cultivation again, a picture repeated in Ban Pak Veng (Barney, 2007).

As poorer households are usually those with the least economic options, were formerly most heavily reliant on wild fish and aquatic resources for nutrition and had least rice production capability, it is these vulnerable families which have benefited least from MCP activities and been most impacted by project impacts. And without adequate compensation for their losses or livelihood restoration measures, it is these families that are most vulnerable to debt and exploitation, who are now allowing their children to work for Oji-LPFL plantations or migrate to Thailand for low-paid work.

BOX 8. Fishery loss mitigation – a total of 4 community ponds in 9 years

After 6 years of MCP implementation and 9 years since dam commissioning, THPC appears to have completed just four community ponds in the downstream impacted villages of the Nam Hai-Hinboun river. (RMR, 2006). The researchers visited two of these four ponds, namely on the Huay Leuk at Ban Tha (constructed in 1998/99), and a newer pond built in 2006 on the Huay Tan, a small tributary of the Nam Hinboun near Ban Kongphat. The pond was formed by building an earth dam across the seasonal stream, thereby creating a long narrow reservoir which stretches back upstream for about a kilometre. The sides are overgrown with trees, bushes and bamboo with little open water available. At its upper end, it connects with a cave, which reputedly holds some fish, although we did not visit it. Nevertheless, it has become a fishery of sorts, intended to compensate for lost river fisheries of the following villages: Ban Nonghang, Ban Hadsaikang, Ban Phontong, Ban Naphouak, Ban Kongphat and Ban Vangdao.

These villages have a combined household number of 353, all of whom would have previously relied on fishery resources from the Nam Hinboun for food and in-



Ban Kongphat fishpond dam erosion (top), and Ban Tha fishpond (above).

come. It is hard to imagine how this many families can gain adequate sustenance and income to compensate for lost fisheries potential, which is estimated to have declined by 44.2 % on this stretch of river since the Project began (RMR, 2006), from such a small water body (< 1 ha surface area), which in itself blocks fish migrations up from the mainstream to the cave, except during periods of flooding. The pond is unstocked, but relies on natural recruitment, most of which will be the more hardy air-breathing fish such as catfish, snakeheads, climbing perch and small cyprinid species. While the number of people using the pond has not been recorded, it is unlikely to be more than 20% of the affected communities.

However, an issue that should be of concern to the impacted communities and EMD was the beginning of dam failure evident on the downstream slope. The dam walls were starting to erode and slump (see photo, top) and it can be reasonably expected that if the dam does not fail in the 2007 rainy season, it will fail for sure the year after. This needs urgent rectification as it could be a matter of human safety when it does fail.

4.1 Fishery related mitigation and compensation measures to date

Given that fishery and aquatic resource issues figured most prominently in the Review of the EMD (Blake et al, 2004), it would perhaps be instructive to revisit the Review and determine the extent to which the main findings and recommendations have been adopted or incorporated into EMD activities in the last three years, on the basis of the present researchers’ observations and findings in five representative villages. Annex 3 lists relevant findings and recommendations from the Review and indicates the degree to which they have been adopted within the villages visited in May 2007.

This sample of villages, together with reports from elsewhere, indicates that EMD has failed to adopt or implement a single recommendation provided by the Review. Despite interviewing a large sample of villagers and village administrators, there was not one person who could claim they had received compensation for direct losses of fish or aquatic resources, from either before the MCP was implemented (1998 – 2001) or in the period since. Furthermore,

there had been no attempt at mitigation of fishery losses, apart from one small dam and reservoir located on Huay Tan, near Ban Kongphat, which itself had questionable benefits and sustainability (see Box 8 and photo above).

The findings of this study with regards to the success of the MCP implementation tend to be corroborated by those of RMR (2006) in the THXP EIA which states (p. 2-144): “EMD embarked from October 2001 on rural development activities which have been taken up by relatively small numbers of families according to their capacities to invest labour and resources, willingness to take risks, and strength of connections with village administrators. Most losses in rice production have not been replaced. No compensation has been paid for lost fish production, although much of this was loss of income. Garden production losses have not been compensated for all affected families, and the people concerned claim they have received only small quantities of rice. Because of budget restrictions EMD has had to introduce its rural development measures gradually over the impacted villages. Some moderately impacted villages are not yet (in mid 2006) involved in the rural development programme.”

5 Outstanding / Unresolved Issues

Apart from the issues raised above relating to the unfulfilled objectives of the MCP and progressive and cumulative nature of impacts caused by THPC operations, there were several other issues raised by villagers during the course of conversations or interviews with villagers which are not directly project-related but warrant further attention by those with the authority to act.

- Electrification of villages along the Nam Hinboun river downstream from Ban Kongphat to Ban Pakveng has not been implemented, despite earlier promises. In many of these villages, state-granted concessionaries came in and laid concrete posts (and in the case of Ban Kongphat cables as well) and took away hardwood trees and timber in return, but an electricity supply was never connected.
- Tobacco growing has been booming the last few years in the upper Nam Hinboun villages and some lower Hinboun villages. From the evidence the researchers heard, it typifies high risk-high reward contract farming, where nearly all the risk is shouldered by the farmer and very little by the agents and buying company. The high level of investment required exposes the farmer's family to a dangerously high level of debt, which if anything goes wrong, will swamp their ability to repay. We heard many tales of debt up to 11 million kip, which may result in many farmers losing their land and other assets if not properly regulated by state authorities. Furthermore, tobacco farmers are required to use high levels of chemical fertiliser and pesticides which are being applied in ways that do not meet basic health and safety standards and pose potential threats to not only the farmer, but also downstream water users, consumers and the wider

environment.

- Pollution in the Nam Pathen tributary is a concern to the villagers of Ban Nong Boua, who say that some livestock in the past have become sick and died after drinking water from the stream. This stream drains from the mining operations of Russian, North Korean and Lao companies situated in the area around Ban Phon Tiew, which was initiated during French colonial occupation. The companies today purportedly mine tin and lead deposits although river water in the Nam Pathen is found to be "dangerously contaminated with zinc, lead, copper and arsenic" (RMR, 2006). Mining and primary processing methods are carried out without even basic treatment of wastewater before release into the stream, which flows a rust red colour downstream to the Nam Hinboun (personal observation). Nearby villagers and DAFO staff reported cattle and buffalo dying with hardened livers in 2004 and an investigation by RMR (2007) into water quality in the Nam Pathen concluded, "Nam Pathen river water at Ban Houayphipheng is significantly contaminated, carrying high concentrations of suspended solids, secondary metals (principally iron and manganese), and toxic inorganics as arsenic and lead. The concentrations of arsenic and lead indicate a potential risk to human health."
- The rapid expansion and growth of eucalyptus plantation concessions granted to Oji-LPFL, a giant multinational pulp and paper business, is causing unmitigated hardship and loss of economic opportunity to dam-impacted local villagers and loss of valuable forest and biodiversity resources to the nation, under a thin pre-text of re-forestation (see Box 6).

6 The Theun-Hinboun Expansion Project – the new threat

In March 2004, THPC announced that they were proceeding with feasibility and EIA studies for a new hydropower project and storage reservoir on the Nam Gnouang river, a tributary of the Nam Theun which enters that river a few kilometres upstream of the Theun-Hinboun diversion dam. The Theun-Hinboun Expansion Project (THXP), if built, would comprise a 70 metre high concrete dam and large storage reservoir, with a 60 MW power plant, and modifications to the existing Theun-Hinboun Power Station and associated structures. THPC has recently expressed its intent to begin construction of THXP in 2008. The rationale of the THXP is to take advantage of improved dry season flows released from the new reservoir to allow an increase in power production, thus making up for future decreased downstream flows resulting from the Nam Theun 2 Hydropower Project from 2008 onwards. The creation of a new reservoir on the Nam Gnouang would require resettlement of a reported 4,753 people (865 households) from 18 settlements who either reside in or have lands in the inundation zone³⁰. The cost of resettlement and compensation for these families was estimated to be in the region of \$47.2 million to \$63.9 million, depending on different resettlement options presented.

If THXP were to go ahead and an extra 220 MW turbine was added to the THHP power station, it would double the current discharges into the Nam Hai and Nam Hinboun rivers. If the project proceeds according to schedule, operation would commence in mid-2011. While the tailrace canal downstream of the power station is planned for enlargement, there are no plans in the Technical Feasibility Report to expand the regulation pond at Ban Namsanam before release of turbinated water into the Nam Hai (RMR, 2006). These changes in flow volume and regime will have pro-

found effects on the erosion and sedimentation profile of the recipient river systems and impair drainage efficiency, which will certainly exacerbate the flooding situation, itself already significantly worsened by the THHP since 1998.

According to project consultants RMR (2006), (plus author's own adaptations) a summary of the main impact events resulting from the THXP on the Nam Hai and Nam Hinboun recipient rivers are as follows:

- The amount of erosion in the Nam Hai and Nam Hinboun will increase and more high value land will be lost each year. Erosion will probably accelerate over several years as a new river channel evolves
- There will be greater levels of sediment carried in both rivers, creating a "sediment wave" that will further decrease the river's suitability for use as drinking and washing water, and shortening life spans of irrigation pumps and canals which will require higher maintenance costs
- Riverbank gardens, many of which have been restarted following the failure of *Suan Theun-Hinboun*, will be adversely affected and damaged by extra flows.
- The fluctuation in dry season water levels will increase, especially during the day and weekends
- Water contamination during construction may make water unfit for drinking or domestic use.
- The already impaired fishery will be further negatively impacted, suffering a second temperature and "sediment shock", causing further declines or even a collapse in fish catches and obsolescence of some present fishing methods/gears. With less power station shut-downs in future, there will be less opportunity to have fishing "respite" than at present, when catching fish becomes relatively easier.

³⁰ Data taken from Reseource Management and Research. 2006. Environmental Impact Assessment. Theun-Hinboun Expansion Project Social Action & Environmental Management Plans. Chapter 5-7-8. Reservoir Compensation, Propitiation, Resettlement, Fishery and Waterway Management Plan. Draft Report. Theun-Hinboun Power Company Limited.

« ...the consultation process has fallen well below acceptable standards for “informed participation” in decision-making»

- Flooding downstream in both rivers will be severely aggravated, negatively impacting an already vulnerable and food insecure population, by destroying crops and creating harder and less productive living conditions for people and livestock. Wet season rice will probably become impossible on the floodplain. Public and animal health concerns will be a greater issue, and the resettlement of communities may be required.
- The river will become more dangerous for navigation, crossing, bathing, washing, swimming and even walking beside, with the risks of drowning accidents significantly increased.

These impacts will not be evenly felt in all communities, but will be most serious along the Lower Nam Hai and upper Nam Hinboun, downstream of the Nam Hai confluence as far as Ban Khen. The impacts will still be “strong to serious” in the communities along the middle Nam Hinboun as far downstream as Ban Pak Veng and upstream along the Hinboun backwater as far as Ban Phakong, according to the EIA (RMR, 2006). Altogether, the EIA estimates that 6,874 households in the Nam Hai-Hinboun basin, comprising 40,118 people in 69 villages (based on 2014 population estimates) will be impacted from the combined effects of continuing present discharges, the Nam Theun 2 Project and the THXP regulation and additional turbine.

6.1 Community awareness and consultation process to date

Given these potential adverse impacts from THXP may only be four years away, the researchers questioned vil-

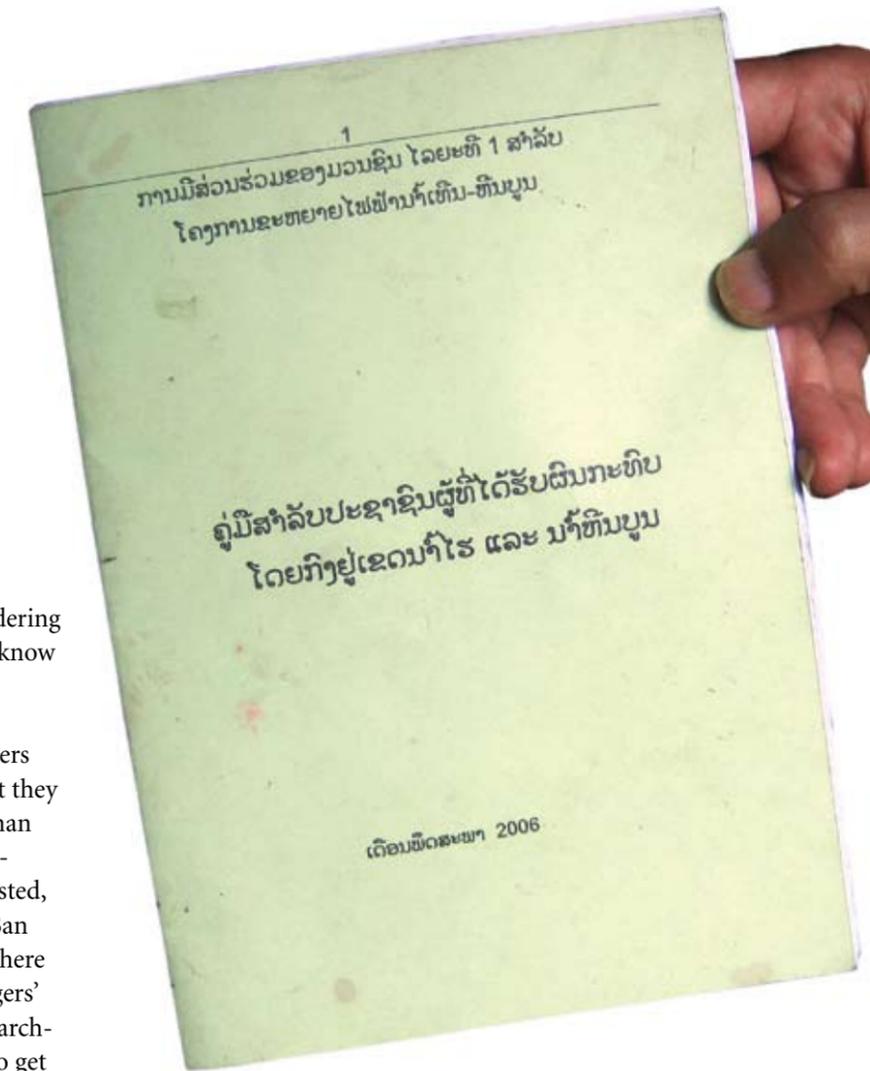
lagers in the five communities visited about the level of awareness of project impacts and the information and consultation process that has occurred to date. While all villagers questioned were aware that there were plans for a new dam (most people we talked to referred to it as *Nam Theun Saam*³¹), their level of knowledge and understanding of the project varied. In fact, some people mistakenly believed that we were from THPC and questioned us about the impacts and whether their village would be flooded or they would have to be resettled or not. Unfortunately, we could not answer their questions, but it hinted at an underlying problem of a knowledge gap that exists between the Company and the villagers.

For most people, the implied threat of resettlement was their biggest concern, followed by loss of wet season rice cropping potential, followed by further declines in fisheries and aquatic resources. All the villages we visited had held at least two public meetings in the village where THPC officials explained the main impacts that would result from the dam. These tended to be very cautious and tentative e.g. “there might be worse flooding” or “the river levels might fluctuate more than at present”, and explained some of the technical details of the project and why it was necessary for national development. Electricity provision for all villages was used as bait for the middle Hinboun villages and there was no opportunity to object to the project, although questions were invited from the villagers. Most wanted to know about resettlement options, but the THPC staff apparently would not be drawn on details. They implied that any resettlement of villages would be voluntary, but the Company would help with certain relocation costs. No involuntary resettlement was talked about, but like at Ban Namsanam near the tailrace and regulation pond, if you did not move,

you could not expect any help. This left villagers wondering what their options really were, given that they do not know for sure how high the water will come.

In a couple of villages we were told by ordinary villagers that they wanted to ask questions at the meetings, but they were scared to speak out, and just left it to the Headman to ask questions on their behalf. This may work in villages where the Headman is widely respected and trusted, but we found in at least two villages (Ban Xang and Ban Nong Boua) this was not the case for many people, where the Headman is viewed as having “sold out” the villagers’ interests over the Oji plantations. Even when the researchers were in the villages, we found that a villager had to get hopelessly drunk before he would dare come and speak with us about his fears over the Expansion Project. There was a common belief that if relocation was necessary due to flooding, that wealthier families would get more assistance than poor families, and they would benefit more from incentives like electricity connection which poor families (many whom are now in debt to buy rice), will not be able to afford³². It can be anticipated that pressure to out-migrate will be highest amongst these families, if not by the parents, by their children on leaving school. Break-down of previously strong kinship and community bonds can be expected in future.

At the public meetings held in the villages, THPC staff gave out information booklets to each family, which explain the salient features of the THXP and the compensation mechanism (see photo, right). This short booklet, cheaply produced, has simplified many complex issues and yet



THXP booklet handed to villagers

is probably very confusing to most villagers, even if they can read (see Annex 1). It ignores or brushes over many basic potential impacts which affected persons should be aware of. Given that many villagers cannot read, especially women who also tend to not attend or sit at the back of meetings, then one comes away with the impression that the villagers have been poorly informed and prepared for this complex, high impact project.

It is the researcher’s impression that the consultation process has fallen well below acceptable standards for “informed participation” in decision-making (WCD, 2000), and there is a large information gap growing as the project develops, which should be rectified before any further decisions are made on proceeding.

³¹ *Saam* means three in Lao, and this refers to the old name for the project (i.e. Nam Theun 3), before Theun-Hinboun Hydropower Project was built, when a dam higher up the Nam Gnuang system was proposed as a potential hydropower project.

³² This issue highlights a growing economic stratification in Lao villages, where certain families are stuck with a stigma of being “poor” and subtle social pressure is put on them to “mend their ways” by going out of the village to earn money. This was most obvious in Ban Thonglom, where the socio-economic stratification was immediately apparent, along with the rate of out-migration amongst young people, especially to Thailand. Thai popular culture penetration and adoption was most obvious out of the five villages with signs such as plastic toys, Thai T-shirts, nose piercings by teenagers and Thai TV jingles being sung, even though nominally it is the most isolated.

6.2 What is at stake if the Expansion Project proceeds?

Although still in draft form, the findings of the Expansion Project's EIA (RMR, 2006) have highlighted both serious unmitigated impacts from THHP occurring in the recipient river basin and serious flaws in the Mitigation and Compensation Programme, which has allowed on-going environmental impacts to worsen, and in some cases accelerate, while failing to adequately compensate for multiple losses to local people. Because the EIA consultants were involved with creating the MCP from an early stage (2000), and have been involved with the project over a period of six years, their knowledge of both the social and physical environment of the impacted area is unrivalled and raises interesting questions about conflicts of interest, both of the consultants and the project developers. While it is not the intention of this paper to unravel and expose these conflicts, their existence should be acknowledged. Indeed, they are openly acknowledged by RMR (2006), when they state, (p. 2-74): "If an operating project's impact events and their consequences have been worse than forecast, and its social and environmental performance have fallen short of its commitments, this can seriously discourage potential investors..... Any contract in which the client pays the consultant to discover facts which can harm the client will ultimately fail **if there are harmful facts to discover**. Contract arrangements offer too many possibilities for the client to impede, interfere with, and in other ways coerce the consultant."³³

Thus, interesting questions are raised about whether the impacts as presented in the EIA match the impacts observed in the field both directly and from villager accounts. While the researcher was only able to meet and interview a small subset of overall affected persons and only made one upstream journey along the river from Ban Nong Boua to Ban Tha, it was apparent that the two sets of described impacts coincide closely in the areas covered by this report, such as erosion, sedimentation, flooding and impacts on fisheries and aquatic life.

These impacts, in combination with others, have created serious economic losses to families living downstream, which RMR estimates amounts on average to an estimated \$293 per year per household (Table 21.4, p. 2-191). Over the course of nine years of project operations for the 3,086³⁴ households considered "moderately to severely" impacted, this would amount to \$2,639 per household or \$8,146,114 overall. Taking into account 5,801 more "slight to moderately" affected households with losses in the order of \$150/household/year on the tributaries and Hinboun upper backwater, these figures rise further.

Due to a shortage of flat land suitable for lowland rice cultivation anywhere else within a 50 km radius for resettlement of families that would lose their land/property from the construction of a dam and reservoir for the THXP at site NG8, it has been proposed in the RMR EIA (Chapters 5-7-8) to resettle on the Nam Hai and Hin-

boun floodplain. It was envisaged that up to 905 families from the Nam Gnouang villages that will be flooded by the NG8 Reservoir could be resettled within existing villages on the Nam Hai and Hinboun floodplain. The assumption has been that host villages would willingly sell paddy land to resettled families as part of their compensation package and THPC would help the villages develop and expand irrigated dry season rice production. However, the consultants point out that any resettlement into the Nam Hai-Hinboun floodplain should not be contemplated if hydraulic studies confirm that current THHP discharges are aggravating downstream flooding and Nam Hai erosion is not reduced considerably (Chapter 21-24, Section 21.14.2). Simply put, they believe that the impacts of flooding destroying wet season rice crops caused by THHP is so serious that there is no margin for villages to receive more settlers, even without the extra flows and flooding anticipated under the THXP flow regime. They point out that any efforts to reroute floods downstream from the chokepoint at Ban Khen, could aggravate flooding on the downstream floodplain and recommend that, "the THXP be delayed until 80% of the families living on the floodplain cascade have successfully adopted dry season irrigation practices for their subsistence staple crop." Judging by the success to date with the MCP dry season rice adoption, this target will take many years to achieve, if ever.

Should the proposed THXP proceed any further, then this raises a lot more fundamental questions about how the rights of affected people will be respected (given the narrow political space for free and open discussion allowed in Lao PDR), and how existing impacts will be separated out from new impacts. Unless a full and genuine procedure is put in place immediately to rectify and mitigate existing damage and compensate for economic losses suffered by downstream project-impacted households, the future does not bode well for affected people.

An immediate step that could be taken by THPC in the next 2008 rainy season, for example, would be to shut down the turbines when flooding reaches near bank-full level, so as to minimise risk of downstream flooding. This action is favoured by RMR, who also recommend THPC employing the services of a fully independent fluvial scientist or institute to study the erosion-sedimentation processes underway in the Nam Hai-Hinboun and make an unbiased judgement about causes and effects, rather than the present approach of hiring a hydraulic engineer to give opinion (R.M. Watson, personal communication). Until such time as present social and environmental impacts are adequately addressed and full reparations for economic losses are made with those impacted, it is inconceivable that the THXP should be allowed to proceed to construction.

³³ At the time of writing it would appear that the original contractual arrangement between RMR and THPC has gone awry and THPC have hired Norplan to prepare a new EIA and resettlement plan, which has yet to be released publicly, although an Executive Summary was released in October 2007. Thus there are now two EIA's pertaining to the THXP, presumably containing conflicting conclusions as to magnitude of impacts.

³⁴ This figure is taken from Table 21.14 (p.2-106) in the RMR EIA which gives population estimates for 2005. It is accepted that a proportion of these households are newcomers who have settled in the area since the dam was completed, although some villages along the Hinboun hardest hit by impacts have actually seen small population declines since 1998, according to Schouten et al., 2004.

Stephen Sparkes, present EMD Manager, was correct when he stressed in the Norplan A.S (1996) Impact Studies for the Theun-Hinboun Hydropower Project that “There is no substitute for rice” for the livelihoods of the people in the Nam Hai and Nam Hinboun floodplain villages. He also dramatically speculated that, “A decrease in the fish population could threaten the very existence of these people as fish is the second most important food after rice and the primary source of protein.” As a result of THHP operations both fish and rice production have significantly declined in the Nam Hai and Nam Hinboun river communities as far downstream as the Mekong confluence. At the same time, populations of shellfish, shrimp and aquatic weed formerly important in local diets have been wiped out along this entire length of river. The principle causes of this decline in aquatic productivity in the river are flow regime and water quality changes from the diversion, and in particular, the change in suspended solids and sediment load transport causing increased turbidity and decreased opportunity for primary production. The source of the suspended solids and “sediment wave” which has been mobilised in the Nam Hinboun channel is unmitigated erosion occurring on the Nam Hai, which has been allowed to carry on unchecked for the past nine years.

Given the scale of reported abandonment of paddy land and decreases in yield of flood-damaged rice, there is clearly a serious situation developing in the Nam Hai and Hinboun villages, noted by the researchers in such manifestations as rotting rice barns and increasing household debt to purchase rice to eat. Inevitably the poorest families with least land, labour and capital resources are feeling the effects of aggravated flooding hardest, while their prospects for practicing swidden agriculture dwindle due to prohibitive state policy and the massive conversion of fertile community forests to monocrop pulpwood plantations. The prospects do not

look bright for the poorest and most vulnerable members of the communities visited along the middle Nam Hinboun, as not only do they benefit least from the dry season rice programme and some other interventions introduced by THPC, but they are being dulled further by Oji-Lao Plantation Forestry Ltd activities. The EMD implementing the Mitigation and Compensation Plan, with its conventional development project approach, has failed to address fundamental issues of environmental mitigation or compensation for project-induced losses, which was a design flaw from the start. Already out-migration of young people in the last few years has accelerated, many as illegal immigrants to Thailand, as a sign of future trends.

Perhaps of most concern given the reportedly high level of profits realised by the THPC is the fact that it has been unwilling to make reparations to villagers for direct losses suffered, such as lost land and property to erosion; lost income from declines in fishery, livestock or agricultural land; lost rice production from flood damage to crops; lost livestock production from flood-related losses, including disease and drowning; lost food and protein sources, especially LAR and rice; and lost livelihood opportunities from a multitude of dam-induced impacts. These impacts and losses stretch back to late 1997 for most communities (and even before for those that suffered damages during the dam construction period), yet there essentially has been no compensation offered or paid to impacted persons, many of whom are now less food secure than before the dam. RMR, consultants to THPC, believe that losses per household over eight years from 1998 - 2006 amounts to \$2,639 on average for 1,916 households at least. If ADB regulations and best practice guidelines were followed to the letter, the amount owing to all affected peoples would amount to between \$11 - \$13 million (M. Watson, personal communication, December 2006).

Given that these direct economic losses have not been addressed by the grossly under-funded, under-staffed, but dedicated EMD, then it begs a further question about responsibility for the demonstrable impoverishment of the downstream affected people, particularly when taking into account the profits obtained from electricity sales these past nine years. Barney (2007) in the Preface to his report on ecological and social transformations underway in Ban Pak Veng, notes that THPC have enjoyed “windfall profits”, partly as a result of the delays in implementing Nam Theun 2 Hydropower Project. It will be recalled that this is a private and publicly-funded project which has received funds from both ADB and NORAD in the past. At the same time, the MCP Logframe stated that it would attempt to follow ADB guidelines for ensuring that affected people receive adequate compensation (in cash or kind) for lost income and that they are not made worse off by projects funded by ADB. Thus, ADB and NORAD most definitely have a case to answer over their past support for THHP.

In recent months, THPC has announced its intention to proceed with the Theun-Hinboun Expansion Project which would divert twice as much water down the Nam Hai and Hinboun rivers, exacerbating unresolved environmental and social impacts already causing suffering and impoverishment to local people. Erosion, sedimentation and flooding impacts would increase, while productivity of fish and aquatic organisms would decline. Mitigation of impacts would be difficult to succeed and expensive, due to the complexity and compounded effects of the existing project, while likely creating a new set of impacts in themselves. The Theun-Hinboun Expansion Project, if permitted to proceed, would be a further disaster for these embattled communities and the rivers that sustain them.

MAIN RECOMMENDATIONS:

Existing social and environmental impacts

- THPC should admit responsibility for aggravated flooding impacts on downstream communities and pay compensation to affected households for lost or damaged property and crops accordingly. The onus of proof must be on the Company to show that they are not exacerbating the flooding situation, through undertaking extensive and independent fluvial studies, open for public scrutiny. THPC should take immediate steps to switch off turbines when a critical flood level is reached during the rainy season, to avoid exacerbating natural background floods.
- Urgent efforts should be taken to reduce erosion and consequent sedimentation in the Nam Hai and Nam Hinboun Rivers. These civil works are likely to be very expensive, but cost cannot be taken as an excuse for inaction or half measures, with findings from an independent and transparent fluvial science study of the downstream channel to be incorporated into mitigation plans. If the civil works entail environmental or socio-economic impacts in themselves, these should be investigated and compensated for at full and fair rates to affected persons.
- THPC should urgently review the main recommendations of the 2004 external review of EMD and take steps to implement them. EMD should concentrate on addressing aquatic ecology impacts and start introducing subsidised small-scale fish raising projects at the household level in impacted villages as a matter of priority. Significant human and financial resources should be assigned to this task, using widely available knowledge and expertise in the region, with close monitoring and evaluation of impact studies made publically available. While

not being a panacea for the replacement of lost animal protein and incomes caused by the THHP impacts, if properly funded and implemented, it would go towards conserving existing aquatic resources and providing improved livelihood options for affected persons.

- More attention needs to be paid to the livestock programme which appears to be losing the confidence of villagers, especially with regards to vaccination subsidies, support for village vets and regular training and extension in animal care. If animals die or become ill during flood events, THPC should investigate the cause and be willing to pay compensation for losses if found to be related to extended flooding.
- A full and independent review of the dry season irrigation programme should be conducted. The programme should subsidise the repair of pumps and hardware where necessary, but needs to pay far more attention to management and extension support. In particular, villagers expressed a desire to receive more farmer-to-farmer extension from successful irrigation sites and more effort applied to trialling alternative crops to rice. Efforts should be made to ensure that the poorest households are included in agricultural activities and intra-village wealth disparities are not allowed to widen further.
- Concerted efforts must be made by THPC to both recapture lost households that have fallen out of the MCP, especially where they are the poorer and more vulnerable families. Activities and livelihood replacement strategies need to be tailored to their level of risk tolerance and ability to repay loans. It has been clear that the dry season rice strategy has largely failed, and needs to be carefully reviewed and revised to ensure participation of all households. Greater emphasis needs to be placed on extension delivery and water management capacity at the local level, with a heavy subsidy provided by THPC until

the threat of wet season flooding is reduced and minimised. Rice shortages caused by flooding damage need to be compensated for to reduce vulnerability.

- For villages that have abandoned the replacement riverbank gardens, THPC should study reasons behind the phenomenon and take steps to remedy the problems, both technical and managerial. Close agricultural extension support is likely to be key to success.
- THPC should review and improve a fail-safe prior warning system for downstream villages, in particular the occasional complete shutdown of power turbines, so villagers are made fully aware of danger periods when water is released suddenly, putting lives and property at risk. This would reduce the risks of drowning accidents which have been reported along the Nam Hai.
- EMD should improve water supply to villages where it is currently of inadequate quantity or quality, both for drinking and irrigation, and regularly monitor the situation. Where THPC-dug wells have failed or dried up, immediate efforts should be taken to provide alternative sources. Providing rainwater harvesting tanks to each household with a suitable roof might well be a cost-effective solution to the water shortages experienced.
- THPC should honour its commitments to build bridges across the river or streams where access has been compromised across traditional routes between villages or from village to production areas as a matter of priority.
- THPC and the Government of Lao PDR should take steps to ensure that the 18 or so downstream villages on the Nam Hinboun earlier promised electricity are connected to the grid as soon as possible at minimum cost to households least able to pay, as a means of compensation for other impacts shouldered.

- Genuine independent reviews of EMD and the mitigation and compensation process should be enacted every two years at least, as recommended in the original MCP and findings should be made public in a timely fashion.

Theun-Hinboun Expansion Project

- THPC should suspend plans to implement the THXP until full and satisfactory compensation for existing losses has been paid to all affected people and adequate measures are put in place to address the ongoing social and environmental impacts in the downstream areas. Where inadequate baselines exist due to THPC-fault, then the benefit of the doubt should be given to the villagers and independent experts consulted.
- THPC should release the full EIA for the THXP at the earliest possible date and allow adequate time for debate of its implications by all stakeholders before any decision is made about the future of the project. EIA results should have a genuine influence on the choice of THXP as a preferred development option.
- Steps should be taken to ensure the full participation of affected households and communities in the decision-making process of future mitigation and compensation strategies and plans, which values local knowledge. This would avoid costly errors in the compensation process, such as establishing riverbank gardens in unsuitable locations prone to flooding or on infertile land.

References

- AMRC. 2006. *The Theun-Hinboun Power Project*. Mekong Brief, Number 3, July 2006. Australian Mekong Resource Centre. University of Sydney, Australia.
- Barney, K. 2007. *Power, Progress and Impoverishment: Plantations, Hydropower, Ecological Change and Community Transformation in Hinboun District, Lao PDR. A Field Report*. Faculty of Forestry, National University of Laos, Vientiane. February 2007. Unpublished Report.
- Blake D., Carson B., and Tubtim N. 2005. *Review of the Environmental Management Division. Theun-Hinboun Power Company Limited*. Draft Review. Submitted March 31, 2004
- Claridge G.F. 1996. *An Inventory of Wetlands of the Lao PDR*. IUCN/UNEP, Vientiane.
- FIVAS. 1996. *More water, more fish? A report on Norwegian involvement in the Theun-Hinboun Hydropower Project in Lao PDR*. Association for International Water and Forest Studies (FIVAS), Oslo, Norway.
- Friend R.F. and S. J. Funge-Smith, 2002. *Focusing small-scale aquaculture and aquatic resources management on poverty alleviation*. FAO Regional Office for Asia and Pacific, Bangkok, Thailand. RAP Publication 2002/17
- IRN. 1999. *Power Struggle: The Impacts of Hydro-Development in Laos*. International Rivers Network. Berkeley, California.
- IRRI. 2002. *Rice Almanac: Source book for the most important crop on earth*. Maclean J.L., Dawe D.C., Hardy B., and Hattel C.P. (eds). CABI Publishing, OXON, UK.
- Maclean J.L., Dawe D., Hardy B., Hettel G.P. (eds) 2002 *Rice Almanac. Los Banos (Philippines), Bouake (Cote d'Ivoire), Cali (Colombia) and Rome (Italy)*: IRRI, WARDA, CIAT, FAO. 253 pp
- NIVA / NINA-NIKU 1995. Annex B1. *Final Report on Aquatic Ecology, Minimum Release and Water Quality. Water Quality and Aquatic Life Study Final Report*. Theun-Hinboun Impact Studies.
- Norplan A.S. 1996. *Impact Studies for the Theun-Hinboun Hydropower Project, Laos*. Final Report. May 1996, submitted to the Ministry of Handicrafts and Industry Hydropower Office, Vientiane.
- Pahlman C. 2000. *The Politics of Studies (and economic fairy tales....) – The role of the ADB in hydro-power development in the Mekong Region*. Paper for Mekong / ADB Symposium – Tokyo, September 2000. Available at <http://irn.org/programs/mekong/010409.adbrole.html>
- Resource Management and Research. 2006. Environmental Impact Assessment. Theun-Hinboun Expansion Project Social Action & Environmental Management Plans. Chapter 21-22-23-24. *Recipient River Fishery, Gardens, Waterway, Water Supply, Sanitation, Public Health, Compensation, Propitiation and Resettlement Action Management and Monitoring Plan*. 2006-11-20
- Draft. Theun-Hinboun Power Company Ltd. Available at: http://rmruk.com/archive/index.php?option=com_remository&Itemid=26&func=select&id=5
- Resource Management and Research. 2007. Final Report. *Water Quality and Feather Sampling and Testing Programme in Hinboun District for JVC*. 23 January to 1 February, 2007. Unpublished Report.
- Roberts T.R. 2004. *Fluvidice: an Independent Environmental Assessment of Nam Theun 2 Hydropower Project in Laos, with Particular Reference to Aquatic Biology and Fishes*. Bangkok, August 2004. (Reissued version of report originally presented to the World Bank in December 1996) Available at: <http://www.irn.org/programs/mekong/tysonfluvidice0904.pdf>
- Ryder, G. 1999. *The Theun-Hinboun Public-Private Partnership: A Critique of the Asian Development Bank's Model Hydropower Venture in Lao PDR*. Power Sector Reform Paper # 3. October 1999. Probe International, Toronto, Canada. Available at <http://www.nextcity.com/ProbeInternational/Mekong/technical.htm>
- Schouten R., Visounnarath V., Souvannalath B., and Volakummane K. 2004. *Evaluation of Environmental and Social Impacts by Theun-Hinboun Hydropower Plant on Aquatic Life and Fisheries*. September 2004. Theun-Hinboun Power Company Limited, Vientiane.
- Shoemaker B. 1998. *Trouble on the Theun-Hinboun – A field report on the socio-economic and environmental effects of the Nam Theun-Hinboun Power Project in Laos*. International Rivers Network, Berkeley, California. April, 1998.
- Sparkes S. 1995. *Socio-Economic and Cultural Survey of selected villages in the Nam Theun and Nam Hinboun catchments. July 1995*. Annex F. Impact Studies for the Theun-Hinboun Hydropower Project, Laos. Norplan A.S. Final Report. May 1996. Ministry of Industry and Handicrafts, Hydropower Office, Vientiane
- THPC. 2002. *Logical Framework: 2001-2006. To implement the 10-Year Mitigation and Compensation Plan of Theun-Hinboun Power Company Limited*. February 2002.
- Warren T.J. *A monitoring study to assess the localized impacts created by the Nam Theun-Hinboun Hydro-scheme on Fisheries and Fish Populations*. Final Report. June 1999. Prepared for the Theun-Hinboun Power Company (THPC), Vientiane, Lao PDR
- World Commission on Dams. 2000. *Dams and Development: A New Framework for Decision-Making. The Report of the World Commission on Dams*. Earthscan Publications, London
- Wronski, E. 2002. *Monitoring and the Mitigation of Erosion of the Nam Hai River, Theun-Hinboun*. Environmental Management Division, Theun-Hinboun Power Company Ltd. May 2, 2002.

1. Translation of THXP booklet given to households living in downstream impacted villages by THPC
2. Summary of economic impacts from THHP on livelihoods of households surveyed in 5 villages visited (Source: Table 21.40, page 2-191 of RMR (2006) EIA)
3. Analysis of degree of adoption of EMD Review Team's Findings and Recommendations (Blake et al, 2004) with regards to impacts on fisheries and aquatic resources in 5 impacted villages in downstream Nam Hai-Hinboun area

ANNEX I

Translation of THXP booklet given to households living in downstream impacted villages by THPC

Theun-Hinboun Expansion Project**Preface:**

The Theun-Hinboun Hydropower Company has planned to build a new dam in order to improve electricity generating capacity.

This dam called NG8, will be built on the Nam Gnuang River, close to Ban Tha Sa La village, creating a large reservoir which would flood an area from Tha Sa La to Sob Chat village.

Throughout the year, the reservoir would prevent the Nam Gnuang water flowing at Tha Sa La village and water would be released into the Theun-Hinboun dam. This water would be used to generate electricity at the powerhouse.

The Theun-Hinboun Hydropower capacity would be more than double the old one. The tunnel, reservoir and canal below the powerhouse would be bigger in order to accommodate the extra water from the powerhouse.

One transmission line will be built to transmit electricity to Thailand.

2. Schedule times:

November, 2008 – 2010 = construction period.

During the construction period, the existing Theun-Hinboun Hydropower Dam will continue to generate electricity as usual.

After the month of April, 2010: NG8 will begin to generate electricity. From June, 2008 - December, 2008: Nam Theun II construction will be completed and begin to generate electricity.

The Theun-Hinboun Hydropower Company hired a consultant (RMR) to implement the Environmental Impact Assessment.

RMR will implement an impact study and plan to reduce impact issues and compensate the losses, after consultation with villagers.

3. Estimation of impacts:

<i>Nov 2008-April 2010</i>		<i>April 2010 onwards</i>
Event • The period of construction of Theun-Hinboun Extension	Event • Nam Theun 2 is completed and releases water down to Sebangfai River to generate electricity. • Nam Theun river has reduced flows	Occurrence • Theun-Hinboun Extension NG8 is constructed and generates electricity • Theun-Hinboun Extension releases more water into Nam Hai river
Impact issues Nam Hai and Hinboun rivers will be turbid and muddy	Impact issues The water flows through the Nam Hai and Hinboun rivers will be water stored in dry season	Impact issues • There will be a higher risk of flooding in rainy season. • There will be more water than before in dry season. The Nam Hai and Hinboun rivers will fluctuate with little change from present

4. How will these changes affect your livelihood?

Theun-Hinboun hydro-power extension will impact or hurt livelihoods of the community, including ethnic minority people in some cases.

Riverbank gardening:

Villagers who practice riverbank gardening on the Nam Hai and Hinboun River below Ban Vangdao village to the Hinboun River mouth will lose land because of erosion caused by the Theun-Hinboun Expansion. It will be more erosive than before.

Household water use:

The Nam Hai and downstream of Ban Vangdao village on the Hinboun river will have increased sedimentation because of the Nam Theun 2 dam, which will release water from its reservoir in the rainy season of 2008 and at the same time, Theun-Hinboun construction will begin in November 2008 to April 2010. Water used for the purpose of drinking and bathing will experience problems. The Theun-Hinboun Hydro-power Expansion project will monitor water quality and announcements to villagers to help understanding if there are any problems with it.

Flooding of land, houses and property:

Villagers who live along the Nam Hai and Hinboun Rivers will experience heavy flooding in the rainy season. After the Theun-Hinboun Expansion Project is completed in April 2010 and during the rainy season of each year thereafter, water releases into the Nam Hai and Hinboun rivers will more than double. This would result in longer flooding, more frequently and over a wider area. The flooding issue will result in loss of land, of rice fields, houses and property (because of sedimentation). The Theun-Hinboun Hydropower Expansion Project must study and consider about the flooding issue. It must plan to solve the problem and let villagers know what will happen.

Land travel:

It will be harder to travel in some areas and create difficulties because of longer flooding. It will flood some roads in the rainy season.

Travel by boat:

In the rainy season, water will rise and fall less than today. It will mean travel by boats will be easier than before.

Animal husbandry:

In the rainy season of 2010, flooding extent will be wider and for longer periods than at present, so animal husbandry will become more troublesome in some areas.

Fisheries:

There has been a reduction in capture fisheries since the Theun-Hinboun Hydro-power Project started operations in 1998 and because of other factors. The Theun-Hinboun Expansion will cause a decline in fisheries due to changes in water quantity and quality.

The criterion for mitigation of impacts and compensation:

Theun-Hinboun Hydropower Company is studying standards for impact mitigation and compensation and is preparing a plan to discuss with villagers.

Concerning impacts caused by Theun-Hinboun Hydropower Company, the policy will be to operate the plant in line with the actual situation and based on consultation with villagers, according to a decree on Compensation and Resettlement of people affected by development projects (No.192/Ngn(192/_",07/07/2005). In Article 6 and 9, each village must organize a Compensation Committee itself, selected by villagers to take care of benefits on behalf of all villagers. The Compensation Committee at the village level is under the umbrella of an Operations Unit at the District level. However, the impact mitigation by the Environmental Control Unit must operate during preparations for the Theun-Hinboun Expansion. But some impact issues caused by the Theun-Hinboun Expansion, will be included in mitigation and compensation plans in line with the improvement and continuation of present activities, based on consultations and discussion with villagers.

Right to receive compensation for losses

Affected people from the Theun-Hinboun Expansion should have the right to receive compensation for losses as follows:

1. Affected people having rights to receive compensation must live or make a living or have land and/or property in the project area before the project began.
2. Based on the economic and social information survey of affected people that was conducted before the project began.
3. Based on the Decree on Compensation and Resettlement of People affected by Development Projects (No.192/Ngn (192/_", 07/07/2005). Within article of 21 and 22:

“A Company will implement a detailed impact study on the payment of compensation for losses as follows:

1. To study the level of impact level twice, based on corrected information correction to allow for compensation for losses.

2. Integrate with the District Operation Committee to designate those with the right to receive compensation for losses, with participation from affected people.”

Process for claims:

A committee for conflict resolution at the district level will be established to solve conflicting claims and other conflict issues. Resolution of conflicts will be based on methods using consultation and transparency to help guarantee the solving of problems with agreement at the project level, before submission to the local government authority and legal mechanisms.

Affected people as a result of the project will not be required to pay a legal or administration fee during the legal process to solve any conflict issues. According to the Decree on Compensation and Resettlement for people affected by development projects (No.192/Ngn (192/_”, 07/07/2005), within Article 13 and Regulation No.2432. November 11, 2005. Regulations for implementing the Decree on Compensation and Resettlement of people affected by development projects have been provided to village headmen.

The Conflict Solution Committee should comprise the following persons:

1. Representative of Local authorities
2. Village headman
3. Representative from affected households
4. Representative from senior citizens and mass organizations or related organizations
5. Project development authority representative

Consultations:

Helped by the mass organizations using participatory approaches. Discussion used to aid co-operation between each related sector including:

1. Villagers living along the Nam Hai and Hinboun Rivers, who are directly impacted people.
2. District authority officers, provincial organizations from: Department of Industry and Handicraft; Science, Technology and Environment Agency; Department of Agriculture and Forestry Office and Women Union.
3. Other concerned persons; Non-governmental Organizations; private companies and others.

Purpose of consultations are:

1. to give correct information about the situation to villagers,
2. to give new information about Theun-Hinboun Expansion to villagers
3. Discussion and consultation with villagers about

impact issues and mitigation and compensations standards.

4. Giving opportunities for villagers to participate in preparation of project. Claims and views of villagers will be sent to Theun-Hinboun Hydro-power Company, in order to help transparent communication with villagers. It is necessary to use group discussions, in order to select the Representative of each village, who would receive information from THPC and send information to THPC about your requests. It is requested for villagers to organize group discussions and select village leaders to report on villager decision-making by using forms and documentation that Theun-Hinboun has arranged.

1 or 2 members of each village, male or female, would be selected by villagers and certified by the village headman, in order to act as a Village Coordinator and be acceptable to villagers. Related organizations must collect information from villagers, passed through the village Headman and send information to the Theun-Hinboun Company.

THPC will check the information that is received. We will have chances to discuss it and consult with each other, in the following topics:

1. Detailed impact issues
2. Details of time schedule of Theun-Hinboun Expansion
3. Details of mitigation and compensation plan
4. Detail of Regulations regarding compensation for losses.
5. Details of claims process
6. Others...

At the same time, villagers must discuss and exchange ideas between each other.

ANNEX 2

Summary of economic impacts from THHP on livelihoods of households surveyed in 5 villages visited (Source: Table 21.40, page 2-191 of RMR (2006) EIA)

Village Indicator	Ban Tha	Ban Kongphat	Ban Thonglom	Ban Xang	Ban Nong Boua
Distance from tailrace (kms)	8	15.7	36	61.2	79.2
# Households	96	37	72	45	62
Paddy area reported abandoned – ha (YEAR)	–	20 (2000)	–	50 – 60 (2003)	35 (2000)
Gross annual loss of rice production (\$/year)	90.8	219.9	245.6	378.0	433.2
Loss of livestock & property (\$/year)	0.0	0.2	14.0	19.3	7.3
Change in fish catches for all households (%)	– 91	– 96	– 89	– 97	– 80
Loss of fishery income since 1998 (\$/year)	35.3	6.7	180.4	114.5	88.5
Annual riverbank garden losses (\$/year)	63.4	13.8	29.3	52.3	3.0
Total annual loss experienced (\$/year/household)	189.5	240.6	469.3	564.1	532.0

ANNEX 3

Analysis of degree of adoption of EMD Review Team's Findings and Recommendations (Blake et al, 2004) with regards to impacts on fisheries and aquatic resources in 5 impacted villages in downstream Nam Hai-Hinboun area

#	Finding & Recommendation	Compliance/Adoption
2	Steps should be taken to directly compensate APs in impacted communities, where appropriate, for loss of livelihood opportunities and social impacts arising from declines in living aquatic resources during the period between dam construction and the start of livelihood restoration activities in the implementation of the MCP (a period of 3 – 5 years in most villages). This issue was recognised under the Compensation and Mitigation principles of the Logframe Summary under the heading "Social Impacts" ³⁵ . This could possibly take the form of material (i.e., non-cash) assistance paid once-only to the village for a widely beneficial project agreed on by the community alone (e.g., a new roof on the school or repairs to the village temple). Villages would receive this compensation according to the recognised level of impacts (perhaps ranked High, Medium or Low) and taking into account previous direct assistance offered	No evidence seen
6	The project should include in the Logical Framework a program to promote sustainable living aquatic resources co-management and education for APs, through appropriate community-based, participatory and inclusive methods. This will require more resources and the recruitment of at least two new staff and innovative partnerships and institutional arrangements to be successful	No evidence seen
23	A long-term, appropriate and on-going fisheries and aquatic resources monitoring programme should be established, which utilises and recognises the importance and benefits of Local Ecological Knowledge (LEK), as well as traditional scientific data collection methodologies, in understanding and responding to the past and ongoing changes occurring at local and basin levels. The approach should be relatively cheap, methodical, easy to implement and analyse data collected, accessible and useful for all interested stakeholders and involve a wide cross-section of APs in impacted communities	No evidence seen
27	Steps should be taken to gradually introduce focused, small-scale, locally appropriate aquaculture promotion activities, initially at a pilot-level in certain suitable communities, with a long-term view to expansion to more villages. The best prospects for small-scale aquaculture lie in the Nam Hai-Hinboun plain and so initial efforts should be focused in this area, but not discounting potential future interest by APs in Headpond and lower Nam Kading villages. The interventions could take the form of a mixture of cost subsidisation of pond construction and limited external material inputs (e.g., fish seed), appropriate training (preferably in-village) and on-going extension and back up for participants. However, it should be recognised that the poorest groups of Lao rural society face significant constraints to entry into aquaculture and so this component should not take precedence over efforts to promote sustainable management of wild living aquatic resources	No evidence seen
28	Sufficient recognition should be given to the possibility that some livelihood intervention strategies of EMD, especially promotion of intensive dry season rice cultivation, may actually have unintended negative or non-beneficial impacts on the health of aquatic ecology, wetland habitats and living aquatic resources-dependent livelihoods in general. While it may be decided by stakeholders that the economic benefits appear to outweigh the ecological and economic costs of resource degradation, at least APs should be made aware of potential risks and who in the community is likely to bear them. This could be a potential topic of research by project staff, a foreign volunteer or Lao MSc or PhD students of agricultural/natural resources management disciplines	No evidence seen

³⁵ Logical Framework: 2001 – 2006. To Implement the 10 Year Mitigation and Compensation Plan of Theun-Hinboun Power Company Limited. February 2002. Page 2 of 7.

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