

Case Study

Compensation and Livelihood Restoration at Nam Theun 2 Hydropower Project

Network for Sustainable Hydropower Development in the Mekong Region



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Abbreviations and Acronyms

ADB	Asian Development Bank
AFD	Agence Française du Développement
AEPF9	9th Asia-Europe People's Forum
APs	Affected Peoples
BOOT	Build-Own-Operate-Transfer
CA	Concession Agreement
CEMMP	Company's Environmental Management and Monitoring Plan
COD	Commercial Operations Date
DAFO	District Agriculture and Forestry Office
DRWG	District Resettlement Working Group
EDL	Electricité du Laos
EDL-Gen	Electricité du Laos- Generation Public Company
EDF	Electricité de France
EDFI	Electricité de France International
EGAT	Electricity Generating Authority of Thailand
EGCO	The Electricity Generating Public Company Limited
EIB	European Investment Bank
EMO	Environmental Management Office (NTPC)
EMU	Environmental Management Unit (GoL)
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GNI	Gross National Income
GoL	Government of Lao PDR
IAG	International Advisory Group
IFIs	International Financial Institutions
ISH	Initiative for Sustainable Hydropower
IUCN	International Union for the Conservation of Nature
ITD	Italian-Thai Development Public Company Limited
LDC	Least Developed Countries
LHSE	Lao Holding State Enterprise
LEnS	Lao Environment and Social Project
LMB	Lower Mekong Basin
LPRP	Lao People's Revolutionary Party
MAF	Ministry of Agriculture and Forestry
MCM	Million Cubic Metres
MDG	Millennium Development Goals
MEM	Ministry of Energy and Mining
MOF	Ministry of Finance
MOU	Memorandum of Understanding
MPI	Ministry of Planning and Investment
MRC	Mekong River Commission
MW	Megawatt
NBCA	National Biodiversity Conservation Area
NGPES	National Growth Poverty Eradication Strategy
NPA	National Protection Area

NSEDP	National Socio-Economic Development Plan
NT2	Nam Theun 2 Hydroelectric Project
NTFP	Non-timber Forest Products
NTPC	Nam Theun 2 Power Company Limited
NTEC	Nam Theun 2 Electricity Consortium
PAPs	Project Affected Persons
PAV	Project Affected Village
PDA	Project Development Agreement
PDR	(Lao) People's Democratic Republic
PPA	Power Purchase Agreement
PLUP	Participatory Land Use Planning
POE	International Environmental and Social Panel of Experts
PROPARCO	Promotion et Participation pour la Coopération économique
PRSO	Poverty Reduction Support Operation
RFA	Reservoir Fisheries Association
RIP	Resettlement Implementation Process
RMA	Revenue Management Arrangements
RMC	Reservoir Management Committee
RMU	Resettlement Management Unit
RO	Resettlement Office
SEMFOP	Social and Environment Framework and First Operational Plan
SHD	Sustainable Hydropower Development
STEA	Science Technology and Environment Agency
VFA	Village Forestry Association
VFG	Village Fisheries Group
VIRF	Village Restoration Funds
WMPA	Watershed Management and Protection Authority
WB	World Bank
WBG	World Bank Group
WCD	World Commission on Dams
XBF	Xe Bang Fai

CURRENCY EQUIVALENTS

(Exchange Rate Effective: June 7, 2010) Currency Unit

US\$1.00	Lao Kip (LAK)
LAK 1	LAK 7,717 (25 June 2013)

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Map 1: Lao PDR in the Mekong Region

Source: Mekong River Commission (MRC, 2011 a p.2)

1 INTRODUCTION

Lao People's Democratic Republic (Lao PDR) is a relatively small, developing country that is sparsely populated and does not have direct access to the sea. It is located in South-East Asia and has a total land area of 236 800 km². The country shares borders with Cambodia, China, Myanmar, Thailand, and Viet Nam, which places it in the centre of the dynamic Mekong region [see Map 1]. Since the establishment of the Lao PDR in 1975, the country has been governed by the Lao People's Revolutionary Party. Administratively, the country is divided into 17 zones, which includes one capital city (*nakhon luang*) known as Vientiane or Vieng Chan and 16 provinces¹(*khoueng*).

In 2012, the total population was estimated to be 6.4 million out of which around 65 % lived in rural areas. The population density of that Myanmar or Cambodia² is almost two and a half times higher than that of the Lao PDR where there are only 27 inhabitants/km², and this also makes it considerably lower than those of Thailand, Viet Nam and China³ However, Lao PDR's population growth does surpass those of its neighbouring countries (1.5 % between 2000/10) (FAOSTAT website 2013). The per capita income reached US\$1,130⁴in 2011 (World Bank website 2013) and it was ranked 138 out of 186 countries with 0.543 on the Human Development Index in 2012 (UNDP 2013 p.154).

It has a tropical climate which is influenced by the South East Asian monsoon. Furthermore around 80 % of the country is composed of hills and mountains, while 52 %⁵ is forested and this leaves only 4 % of the land suitable for cultivation (Times Reporters 12 January 2011, Barney and Canby 2011 p.14, FAO 2011 p.3).

The Lao PDR is a country with extensive natural resources and over half (54 %)⁶ of its wealth is in the form of natural assets⁷ namely water and hydropower potential, agricultural land, forests and minerals (including copper, gold, gemstones and gypsum) (World Bank 2010 p.10).

¹According to the Instruction no. 01/PM (11/3/2000) the provinces are the strategic units, the districts are the planning and fiscal units and the villages are the implementation units. The whole country has 143 districts and 8666 villages (2010/11).

² Density: Myanmar: 72 inhabitants/km² and Cambodia: 80 habitants/km²

³ Density: Thailand :136 inhabitants/km² ; Vietnam : 271 inhabitants/km² and China : 144 inhabitants/km²

⁴ Lower-middle-income economies are those with average incomes of U\$1,006 to US\$3,975. Using the Atlas method, Lao PDR's GNI per capita was US\$1,130 in 2011.

⁵About 12.5 million hectares in 2011. Forest coverage in Lao PDR was around 70 % in 1940, covering 17 million hectares. This figure dropped to 54 % in 1973, 47 % in 1982 and 41 % in 2001. Therefore the government has set a target to return the country's forest coverage to 65 % by 2015 and 70 % by 2020.

⁶ Hydro-electric (18.0 percentage points) ; Agricultural land (16.0 percentage points); Forest and Protection Areas (11.0 percentage points) and Minerals (9.0 percentage points).

⁷ Overall, Lao PDR's total wealth has been estimated to be around US\$10,000 per capita, one of the highest levels in the low-income country group.

The Mekong River⁸ is the country's main river and 90 % of the land area is located in the Mekong river basin and this contributes to 35 % of the Mekong's total flow (473 km³) (WREA 2008 a p.47, WREA 2008 b, MRC 2011 a). This means that most of the rivers in the country are Mekong tributaries and these amount to about 39 main tributaries. There are eleven main rivers that have a catchment area in excess of 5,000 km² ⁹(WEPA web site 2012). The total renewable water resources are therefore an estimated 333.55 km³/year, which annually amounts to more than 55,000 m³ per capita. However given this situation little of the national available water supply has been developed. In 2011 the total dam capacity was estimated at 7.8 km³ or 2.8 % of the annual surface water supply (Frenken 2012 p.300, WEPA 2012 a p.82, WEPA 2012 b p.56). The mountainous landscape favours important rainfall, with an annual average of 1 834 mm which ranges from 1 300 mm in the northern valleys to over 3 700 mm at higher elevations in the south. About 75 % of the rainfall occurs during the rainy season which runs roughly from the middle of April to the middle of October (FAO web site 2013).

Rivers and rainfall which are the basic ingredients of hydropower development are in plentiful supply, and the mountainous landscape¹⁰ offers a natural means of generating the hydraulic momentum that can be transformed into electricity. This abundance of hydropower resources and its central location in a rapidly growing region provide Lao PDR with a strategic advantage due to the fact that power markets in the region are becoming more closely integrated. The country's great potential for hydropower development has theoretically been estimated at 26,500¹¹ megawatts (MW), excluding the Mekong mainstream. Out of this about 18,000 MW are technically exploitable. Around 15% of the country's hydropower potential has been developed over the past 40 years (ADB 2004, GMS 2004, DEB web site 2013). Small scale hydropower projects below 15 MW have not been included in this estimate, which would potentially be about another 2,000 MW. In Lao PDR hydropower projects with capacity below 15 MW are classified as small-scale and where large dams are defined as having an installed capacity of more than 50 MW or inundating more than 10,000 ha of land at their full capacity. This applies to hydropower projects that were constructed after 1990 (GOL 2005, MEM 2011 p.9).

Indeed, the Government of Lao PDR (GoL) aims to develop the country's hydropower potential by building several new small to big-sized hydropower stations in the context of increasing power demand from its neighbours¹². This is coupled with the opening of the country's economy for outside investment in 1986 and the rise of regional banks and

⁸ Ranking 21st in length at 4,880 km (Gupta and Liew 2007) and 8th in terms of annual discharge (flow), at about 14,500 m³/s (Meade 1996; MRC 2005). It has a catchment area of 795,000 km² that lies within six countries (China, Myanmar, Lao PDR, Thailand, Cambodia and Viet Nam). The Mekong basin has been commonly divided into upper and lower basins, and the upper Mekong basin known as Lancang Jiang is located in China.

⁹ 1. Nam Ou; 2. Nam Khan; 3. Nam Suang; 4. Nam Ngum; 5. Nam Nhiep; 6. Nam San, 7. Nam Theun - Kading; 8. Nam Xe Bang Fai; 9. Xe Bang Hiang; 10. Xe Done; 11. Xe Kong

¹⁰ Some 80 % of the country's area is composed of hills and mountains with the highest point being Phu Bia at 2820 m above sea level.

¹¹ Source : Department of Energy Business (DEB), Ministry of Energy and Mines, May 2013 [<http://poweringprogress.org>]

¹² Hydropower export is driven by demand in Thailand and Viet Nam and to a lesser extent Cambodia.

investors in Asia (Smits 2011). Before 2006, the country only had nine hydropower dams, with a capacity of 680 MW. Currently, it has 18 hydropower plants in operation (including small and big sized) producing 2,800 MW [see Map 2] and 17 under construction¹³ for a further 3,000 MW¹⁴, which includes 1,850 MW from the Xayaboury dam in the Lower Mekong Basin. Another 25 plants are at the planning stage (6,500 MW)¹⁵, while 35 more are undergoing feasibility studies¹⁶ with a total production capacity of 10,600 MW (Chandara 03 April 2013 p.3, EDL 2011, Ministry of Energy and Mines 2011, Mekong Institute 2012, MEM 2012, MEM 2012 August, MEM 2013 March). If all the planned projects are completed, the Lao PDR would be able to produce 70% of the basin's energy (93,800 GWh) with equal contributions from mainstream and tributary dams (MRC 2009, MRC 2011 a p.81). Cambodia would produce 20%, largely from the Sambor Dam on the Mekong mainstream, whilst Viet Nam would produce 9% and Thailand 0.4% (MRC, 2011 a p.85). Map 2 shows the total installed capacity of both existing and planned projects on the Mekong mainstream and tributaries for all four lower Mekong countries.

Moreover, becoming the “battery of Southeast Asia” or “Southeast Asia’s Kuwait” through the exploitation of its hydropower potential has been GoL’s long term dream (Leechuefoung 2006, Imhof 2007, Lawrence 2008, Christopher G 2012) and there is also the challenge to fulfil its strategic plan which has projected that by 2015, 80 % and by 2020, 90% of households in the whole country must have electricity usage. To date the figures are that 78% of the Lao population has access to electricity (EDL 2010 a, EDL 2011) and many are optimistic that Lao PDR will become “the battery of Southeast Asia”:

“Hydro-power resource is probably the only economic activity where Laos has a comparative advantage over other countries in the region”(ADB 1999),

“The vast hydro-power potential of our country should be exploited to the maximum. We can foresee there will be limited adverse impacts on the environment and communities,” said the Vice Minister of Industry and Commerce, Dr. Nam Viyaket (Vientiane Times, 11 April 2005).

“There are many potential benefits for Lao PDR from hydro-power particularly from direct links with southern China, Thailand, Malaysia and indirect links with Singapore and Indonesia. These offer classic gains from sharing and dealing in a wider market. Electricity could be the key for Lao PDR to become a high growth country” (Porter and Situmeang 2005).

The GoL’s primary benefit from the export of electricity includes the revenue that is generated by: (i) profit tax: 15 percent of net profit, (ii) royalties: 5-15 percent of gross revenue and (iii) dividends: equal to the net profit after depreciation, tax and other payments. The Lao PDR is one of the poorest countries in the region and so these revenues may then be used to promptly reach the goals of the Seventh Five-Year National Socio Economic

¹³Concession Agreement (CA) stage.

¹⁴This does not include the biggest project to date (about US\$3.7 billion) in Hongsa district, Xayaboury province which is larger than the US\$1.3 billion 1,075 MW NT2. It is the first lignite-fired power plant which involves the construction of a 1,800 MW capacity (3 units of 600 MW each), and is scheduled for completion at the end of 2015. Roughly 2,000 people (400 families) will have to be relocated.

¹⁵Project Development Agreement (PDA) stage.

¹⁶Memorandum of Understanding (MOU) stage.

Development Plan (NSEDP)¹⁷ from (2011-2015), the Millennium Development Goals (MDGs) and the National Growth Poverty Eradication Strategy (NGPES)¹⁸ which is central to the national development agenda. The NGPES encapsulates the essence of Lao PDR's approach towards achieving the goal set in 1996 by the 6th Party Congress, namely to exit from the ranks of Least Developed Countries (LDCs) by 2020 (GoL 2004, GoL 2008, GoL October, 2010). According to the national poverty line¹⁹, there was a significant decline in the incidence of poverty, as it fell from 46 % of the population in 1992/93 to 20 % in 2009/10. In 2008 34% of the population were living below the international poverty line of \$1.25 per day and as many as 66% of the population were living on less than \$2 per day. (Epprecht, Minot et al. 2008, Chen and Martin 2008 August, Engvall, Nina et al. 2009, Bartlett 2012, World Bank 2012 b).

Traditionally, the Lao economy remains predominantly driven by agriculture much of it subsistence, and this is dominated by rice cultivation in the lowland areas (accounting for 65 % of the total cultivated area). In 2011, the agricultural sector accounted for 31 % of the total of GDP (compared to 35 % for the industrial sector and 34 % for the service sector), although agriculture continues to employ about 4.5 million people (783.000 households)(MAF 2012). Today, the economy is projected to benefit from the country's extensive natural resources by starting to transform this natural wealth into other forms of capital (World Bank 2010 pp.9-10).

NGPES identified the power sector as one of the potential drivers of growth. The sector serves two national priorities. Firstly, it promotes economic and social advancement by providing a reliable, affordable, and sustainable domestic source of electricity. Secondly, it mobilizes foreign exchange and budgetary revenues to finance poverty reduction as well as environmental and social programs. Moreover, the 7th NSEDP strongly emphasizes the utilization of natural resources as a key driver for economic growth and poverty eradication. According to the first session of the 7th Legislature of the National Assembly and 9th Congress of the Lao People's Revolutionary Party (LPRP)²⁰, the government will also facilitate investments in hydropower plants from 2011 to 2015 (Times Reporters January 14, 2013, Vaenkeo March 16, 2011, Xayasomroth March 21, 2011, Times Reporters June 24, 2011, MPI 2011).

¹⁷Currently, it is the 7th NSEDP which was adopted by the National Assembly in June, 2011 and became operative in October, 2011.

¹⁸Under the aegis of the Poverty Reduction Strategy Paper (PRSP), the government developed a NGPES in 2003/04. The NGPES defined various targets with 44 related indicators to be monitored over time, including on poverty reduction, agricultural growth, health, education, and governance. So the NGPES has the dual objectives of enhancing growth and development and reducing poverty. The NGPES defines economic growth, socio-cultural development and environmental preservation as the three pillars of Lao PDR's development policy.

¹⁹The poverty headcount is based on the National Poverty Line, which is defined as consumption of less than 2,000 Kcal a day. Under the new plan, the rate of essential per capita income will be increased to 253,000 kip (35 \$) per person/month for people in rural areas and to 284,000 kip (40 \$) in urban areas (Phongkhao, Somsack 18 April 2013 p.1)

²⁰The first congress was held in March, 1955, in the revolutionary stronghold of Huaphan province. It was attended by more than 20 delegates representing more than 300 Party members nationwide. The 9th congress was held in March 2011, and was attended by 576 delegates representing more than 191,700 Party members.

The Lao PDR is a member of the Mekong River Commission (MRC), which seeks to develop and adopt an integrated approach to river basin management in the sub-region. It has been working with other countries in the Greater Mekong sub-region in developing an integrated power market. It has also been a key participant in the development of bilateral power trade, signing memoranda of understanding (MOU) with Thailand (for 7,000 MW), Vietnam (for 5,000 MW) and with Cambodia (for 1,500 MW) to export hydroelectric power until 2020 (DEB web site 2013). With the recent commissioning of Nam Theun 2 and given the projects currently in the pipeline, the annual net government revenues from hydropower exports could grow twenty-fold from relatively little today (US\$17 million) to approximately US\$350 million by the year 2020 (and could exceed \$700 million by 2025) (World Bank 2010 p.65). In one of the recent developments the government expects to earn US\$3.9 billion from the Xayaboury dam throughout the 29-year concession period, including US\$1.897 billion in royalties and US\$637 million in taxes (Times Reporters 5 March 2013 p.B1).

Actually, the contribution of hydroelectric power was about 0.5 percentage points of real GDP growth (7.4 %) between 2005/09 and is projected to be 3 percentage points of GDP growth (7.7 %) between 2010/14. As with GDP shares electricity is projected to surpass mining in terms of its contribution to government revenues by 2015. Four percent of GDP will come from hydropower and only 1.2 percent from mining by 2024 (Davading 2010, ICMM 2010). According to a key ADB report, hydropower output jumped by 29% to 13.8 billion kilowatt hours from 2012 to 2013. New hydropower projects commissioned in 2012 increased national output by more than 650 MW, or an increase of 12% in terms of power generation in 2013. It should be noted that 70% of all hydropower which is generated is then exported, mainly to Thailand (Times Reporter April 10, 2013 pp.1&3, ADB 2013).

Existing and projected dams in Lao PDR and in the world are the subject of extensive debate regarding their impact on the environment, notably the changes in the ecology of the rivers (Duganp, Barlow et al. 2010), as well as their carbon footprint (Chanudet, Desclox et al. 2011). Socio-economic impacts are also likely to be important, which amongst others include resettlement, flooded agricultural land and declining fishing activities. (McCully 2001, Savoie 2003, Scudder 2005, Heggelund 2006, WCD 2008, Barney 2009, Hirsch 2011, Bhatia, Cestti et al. eds, 2008, Molle, Foran et al. eds, 2009). According to a World Bank "Laos Development Report 2010":

"...the 42 planned dams for which data are currently available, the total inundated area is estimated to be 3,086 square km. Two hundred and ninety-three villages will be directly affected, including a total of around 100,000 people who currently live on the land that is to be inundated. An estimated additional 49,000 people live within one hour's walk of a current or planned reservoir. This is based on information for 42 projects in different stages of implementation, though as many as 90 hydropower projects are being planned in total (of which 46 are still in the feasibility study phase). Moreover, several dams are being considered in the mainstream Mekong River, and these will have major environmental effects both locally and across national boundaries"(World Bank, 2010 p.31).

However, the Government's plans are ambitious in light of various constraints and in particular the fact that the hydropower sector may be developed faster than the Government's ability to scale up its capacity to manage it effectively. The dual challenge it faces is not only "how to do the right projects" but "how to do the projects right" for sustainable hydropower development and how to meet and participate in the Rio+20 issues on "Trade and Green Economy". Hydropower export in Lao PDR is referred to as a "selected

green sector with trade potentials” to build a green growth strategy to develop the economy in a sustainable manner, use energy efficiently and to develop renewable energy.

Moreover, the sustainable energy production was one of the main topics discussed by delegates at the 9th Asia-Europe People’s Forum (AEPF9)²¹ (ASEMINFOBOARD November, 2012). Discussions were enthusiastic and mostly emphasized the positives of hydropower and the benefits that it can bring to Lao PDR. Several Lao attendees offered their opinions on this matter by highlighting the potential of hydropower development when it comes to improving people’s livelihoods as well as socio-economic development in the region and the world. The GoL says it always gives priority to social as well as environmental issues to ensure that hydropower projects are beneficial for local communities and highlighted:

“... the Nam Theun 2 dam, which has become one of the world’s best models of sustainable hydropower development. The project has been held up as a model of environmental and social responsibility, enabling local people to lead better lives. The Nam Theun 2 dam not only helps to improve livelihoods in the area but also contributes to sustained economic growth, which will help Lao PDR in its endeavours to graduate from least developed country status by 2020” (Times Reporters October 18, 2012 pp.1&3).

Recently, Lao PDR hosted the 19th meeting of the MRC Council from January 14 to 17, 2013 in Luangprabang province to discuss issues particularly regarding sustainable development in the Mekong basin. This annual meeting is a requirement according to the 1995 Agreement (Times Reporters January 14, 2013 p.3, MRC 1995). It was stated that the MRC will continue to support Lao PDR’s bid to develop hydropower on the Mekong mainstream as long as the projects are sustainable, and according to a top MRC official:

“MRC is a framework and it supports sustainable development. In that context, if hydropower on the mainstream fits into that framework, then obviously the member countries are in support of it,” said MRC CEO Hans Guttman²² (Times Reporters January 18, 2013 p.1).

Moreover, a high-profile team comprising 14 senior Lao government officials deemed to be ‘policy makers’ on dam development have just ended a week-long study tour in Tasmania, Australia, where they learnt more about the sustainable development of hydroelectric dams from the island state. The trip, which was financed by the World Bank and AusAID ended on May 5, 2013., This has strengthened the government’s commitment to strive for the sustainable development of hydroelectric dams. The Lao PDR has enormous untapped potential as it seeks to become ‘the Battery of Asia’ in this area (Vaenkeo May 16, 2013 p.11).

The GoL has made substantial progress on the ground and at a policy level with regard to sustainable and environmentally friendly development. As the Minister of the Environment and Natural Resources, Mr. Nourin Sinbandhit, highlighted in a workshop, the advances

²¹This was prior to and in conjunction with the 9th Asia-Europe Meeting (ASEM9). The Asia-Europe People’s Forum (AEPF9) held its 9th biennial People’s Forum on October 16-19, 2012 under the title "People’s Solidarity against Poverty and for Sustainable Development: Challenging Unjust and Unequal Development, Building States of Citizens for Citizens".

²²Chief Executive Officer of the Mekong River Commission.

which were made in perpetuating sustainable hydroelectric development ran from 2007-2010. This policy designed a platform for the future development of hydroelectric power projects.

"This is extremely important for Lao PDR, particularly when it seeks to develop mega hydroelectric projects," He further added that about 40 to 50 hydroelectric projects were expected to be operational by the end of 2025 (Vaenkeo and Cascaro May 20, 2013 p.3).

Furthermore Ms Keiko Miwa the World Bank's Country Manager for Lao PDR highlighted in a speech that:

"The establishment of environmental and social legal frameworks through the Lao Environmental and Social Project (LEnS) is significant, but the key is putting these frameworks into practice"(Vaenkeo and Cascaro May 20, 2013 p.3).

On May 22, 2013 Government energy officials met with hydropower experts from around the world to discuss ways to advance sustainable hydropower. It was known as the International Hydropower Association's (IHA) World Congress on Advancing Sustainable Hydropower which took place in Kuching, Sarawak, Malaysia from May 21–24, 2013²³. Mr. Viraphonh Viravong²⁴ made the following comment according to a media release from the Lao Ministry of Energy and Mines:

"We are here to learn how to achieve sustainability in hydropower development based on international standards and practices". He further expressed the GoL's commitment to move ahead with the sustainable development of its vast hydropower resources. "The Lao government is responsible for developing the country for the well being of our people. We must develop our resources in a practicable way using international standards and the best, most sustainable methods available to us" (Times Reporter May 23, 2013 p.1.)

The IHA's Executive Director Richard Taylor said the IHA's biennial congress is considered the world's most important gathering of hydropower decision makers.

"IHA²⁵ is a network of more than 100 member organizations and partners working to advance sustainable hydropower (Times Reporters May 23, 2013 p.1).

A senior energy official remarked that although it is a poor country, Lao PDR will try its best to meet international hydropower sustainability standards. Furthermore the Deputy Minister of Energy and Mines Mr. Viraphonh Viravong commented during an IHA World Congress debate on whether hydropower sustainability standards kept poor countries like Lao PDR from developing their economies that:

"Most people don't want to live in the past; they want better lives for themselves and their children. A government has a duty to bring about that change to the best of its ability and as rapidly as it can" (Times Reporters June 4, 2013 p.B2).

²³More detail on [<http://ihacongress.org/congress/>]

²⁴Deputy Minister of Energy and Mines.

²⁵IHA has developed the Hydropower Sustainability Assessment Protocol to guide and score economic, environmental and social aspects of sustainability during the early stages, preparation, implementation and operation of hydropower projects.

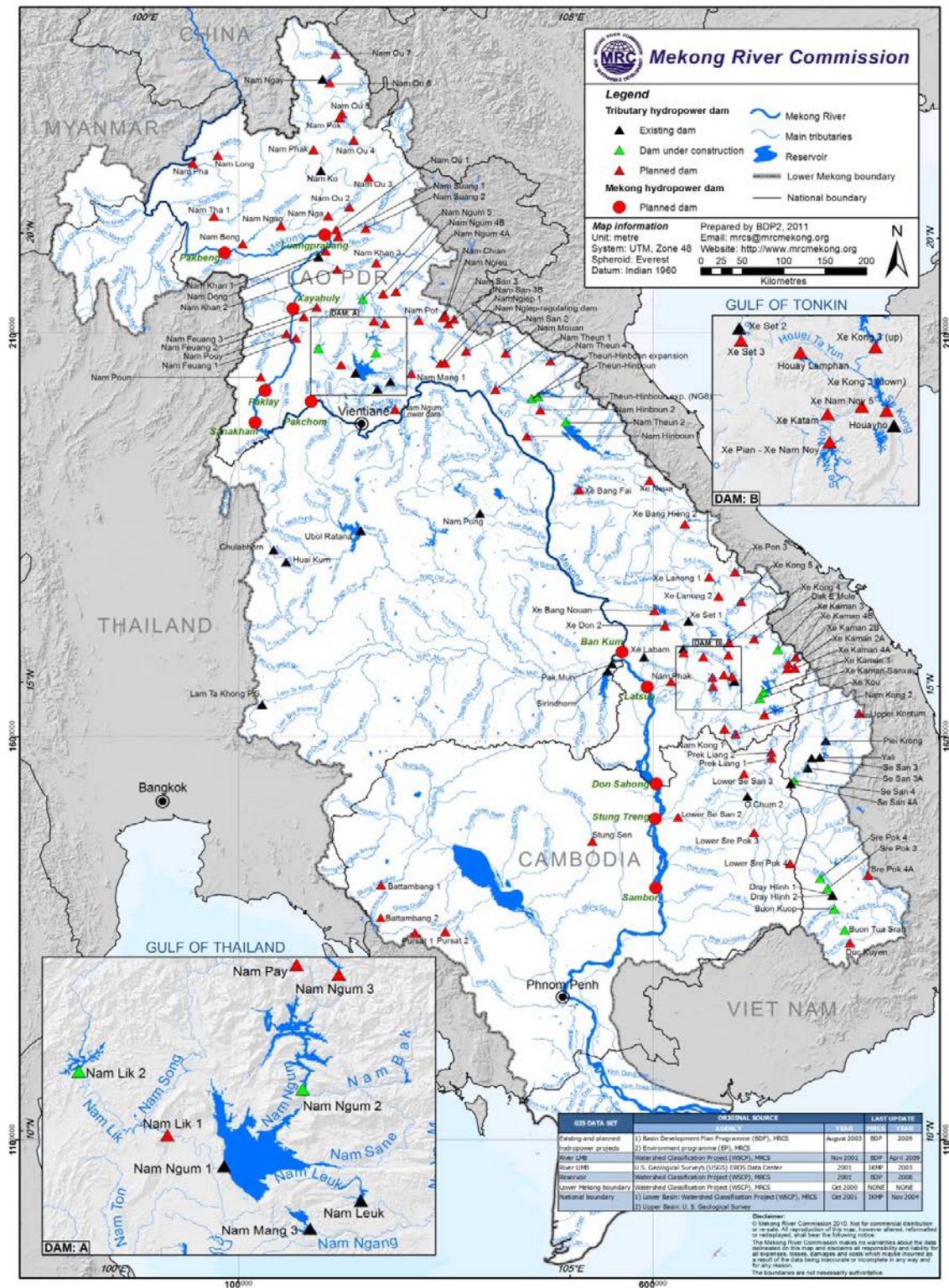
A senior environmental specialist with the Inter- American Development Bank, Mr Emmanuel Boulet, noted that:

"The Green Economy movement of the UN Conference on Sustainable Development (Rio+20) held the view that "welfare" is more important than "growth". "What ultimately matters is welfare and not output," "Even so, hydropower can contribute to "green growth." (Times Reporters June 4, 2013 p.B2)

Another panellist, the energy developer Arun Sen, who is Lanco International's CEO said: *"Infrastructure builders understand that development has long-term impacts. Hydropower, more than thermal energy, poses a unique challenge because it takes years for the impacts of current decisions to be seen clearly. That doesn't mean hydro development should be paused" (Times Reporters June 4 2013 p.B2).* President of the Third World Centre for Water Management, Ms. Cecilia Tortajada acknowledged that: *"Hydropower was now being viewed as clean energy, whereas in the past it was seen as a problematic form of energy production"(Times Reporters June 4, 2013 p.B2).* Consultant Joerg Hartmann added: *"Hydropower projects often generate conflict, especially when it comes to balancing local, national and international priorities. However, measures of sustainability do already exist (Times Reporters June 4, 2013 p.B2).*

Recently, the International Finance Corporation (IFC), a private arm of the World Bank has been helping the GoL to revise the Water Law in order to back water management and hydropower development in the country so as to ensure equitable future management of water resources. According to the IFC, it has held several public consultations with the government, where stakeholders from the government, civil society and international organizations have been able to give their feedback on the draft law (Times Reporter 11 June 2013 p.3). While on the one hand hydropower boosts economic growth, on the other it also increases competition among water users.

Existing and planned hydropower projects



Map 2: Existing and Planned Hydropower Projects in Lao PDR

2 CASE STUDY SCOPE

The MRC has established the Initiative for Sustainable Hydropower (ISH) with the aim of seeking to embed sustainable hydropower considerations into the regulatory frameworks and planning systems of member countries and into project level planning, design, implementation and operational activities. The ISH 2011-2015 Strategy emphasizes this requirement as well as the need to take into account the wider development implications in order to meet the region's growing demand for water and energy through sustainable hydropower. Therefore, the approach towards "sustainable hydropower development" should aim to balance social, economic and environmental aspects for all parts of society and at all stages of planning, construction and operation of hydropower projects.

Within this context, the MRC-GIZ cooperation program component "support to sustainable hydropower development in the Mekong Basin" has a human resources development element that will support efforts to strengthen capacities for a sound understanding and appreciation of socio-economic issues and ecological complexities as the basis for sustainable hydropower development (SHD). Its goals are threefold:

- (i) Increase awareness regarding SHD at all levels of decision making;
- (ii) Enhance knowledge and skills at academic and research institutions, and
- (iii) Provide professional training for planners and managers to cope with the challenges of SHD.

Accordingly, GIZ aims to support academic and research institutions in the LMB countries Cambodia, Lao PDR, Thailand and Viet Nam to develop a knowledge and learning network in the Mekong region (SHD-Network Mekong) to enhance their capacities and to share experience on good practices from the region. The good practices will be enriched by reference guidelines, assessment tools of good management practices on dams and hydropower development worldwide, for example the Hydropower Sustainability Assessment Protocol of the International Hydropower Association and the UNEP Dams and Development Program (an international follow-up program of the World Commission on Dams).

The SHD requires an integrated and multidisciplinary approach. Many topics are interrelated and may overlap in the analysis and description of good practices. In order to demonstrate the good practices and lessons learned of hydropower development in Lao PDR, we have selected the Nam Theun 2 (NT2) hydroelectric power project for our case study.

Preparation of the \$1.45 billion NT2 in Lao PDR represented an important milestone. It is perceived as a model dam project but at the same time NT2 is one of the most criticized hydropower projects in the context of a development panacea for a cash-strapped government, developers, investors, international development partners and other stakeholders. It is for this reason that NT2 is a very important case to review and to learn about their practices in the whole project process through from the planning, construction and operation phases. Particular focus is on the project's environmental and socio-economic development plans for the directly and indirectly affected populations including those both upstream and downstream.

Our case study focuses on two **sub-topics** which are related to the following social aspects:

- (i) Compensation and mitigation, and
- (ii) Integrated resource development plans for affected local people.

3 RESETTLEMENT POLICY FRAMEWORK

This case study particularly examines the GoL's laws, decrees and guidelines, as well as the international policies of organisations such as the World Bank and ADB.

3.1 Involuntary Resettlement in Lao PDR

While involuntary resettlement is not new to the Lao people - centuries of changing fortunes have seen villages and groups of villages relocate to survive - what is relatively new is the need for people to relocate in order to make way for development of projects considered to be in the national interest, such as hydropower schemes (Goudineau 1997 ed).

Beginning in 1975, the GoL began moving ethnic minorities out of mountainous and remote areas, due to security concerns. In the early 90s, the GoL began to express its concerns about the shifting cultivation practice in the mountainous areas especially in the Northern and Eastern parts of the country. The result was that hundreds of thousands of families from various upland areas were resettled. The concentration of these scattered communities, as well as their cultural and livelihood integration with the ethnic people of the lowlands has long been a goal of the central government. Moving scattered remote upland communities into more accessible areas facilitates easier and cheaper provision of essential development services such as health care, sanitation, education, roads, irrigation and electricity. (Government of Lao PDR 1998, Baird and Shoemaker 2005).

Most of the recent and ongoing resettlement projects resulting from natural resource development are concerned with hydropower and mining projects. Many of these projects have to contribute to the development of the local areas, through the building of new infrastructure and the provision of public services. This has already been the case with the Nam Theun Hydroelectric Project, Nam Theun Hinboun and Nam Ngum 2 amongst others.

However, resettlement has always affected the social systems, livelihoods and cultures of indigenous ethnic communities. In most resettlement cases people have had to provide everything by themselves. In many cases no compensation is paid for resettlement nor is adequate infrastructure such as housing, electricity, clean water and food security provided. Therefore resettlement often results in increased levels of poverty due to economic pressures and the need to purchase more expensive land. A number of programmes and policies currently in place are seeking to deal, directly or indirectly with this resettlement issue.

In 1975, the Lao People's Revolutionary Party (LPRP) abolished the 1947 Constitution and all previous legislation. The majority of the existing legislation, especially in the forestry sector, has been issued under the framework of the Constitution of 1991. The current legal system can be described as a hybrid of a civil code and common law system, driven recently more by the need to adopt a large body of legislation, rather than by the capacity to implement the legislation (NTPC 2005 d chp:5)²⁶.

²⁶Chapter 5: Policy and Legal Framework and Entitlements is in Volume 4: Project Lands: Resettlement Plans (in the Social Development Plan).

The National Assembly²⁷, first elected in 1992 under five-year terms, has been an active legislative branch by passing nearly 50 comprehensive laws, each requiring issuance of implementing legislation by the Prime Minister, ministries and local authorities by way of decrees and regulations. Despite this growing base as a civil law structure, the legal system remains at an early stage, difficult to interpret, implement or enforce, especially in the natural resources sector (NTPC 2005 d chp:5).

We will review some of the key legislation relevant to our case study, especially the national policy on sustainable hydropower, resettlement and compensation.

3.2 Donor Resettlement Policy

In the past the commitment on the part of investors to look after those people that have been resettled involuntarily due to hydropower projects depended very much on the agreement that was negotiated between them and GoL in the CA. Different investors have varying operational policies and so for example those of Chinese investors are not the same as those of ADB and WB. In the case of the latter all CAs have to respect and adhere to their policies regarding involuntary resettlement with development projects.

The World Bank's operational policy specifies that "*displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher*". The two major strengths of this policy when dealing with involuntary resettlement are as follows:

- "*Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs.*"
- "*Resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in the project's benefits*"(Scudder 2005 p.122).

The World Bank's OP/BP 4.12 (2002) aims to avoid involuntary resettlement to the extent where this is feasible, or to minimize and mitigate its adverse social and economic impacts. It promotes participation of displaced people in resettlement planning and implementation, and its key economic objective is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement. The policy describes compensation and other resettlement measures so as to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to World Bank appraisal of proposed projects (M-IWRM 2010 p.6).

An additional objective of the IFC's performance standard 5 on Land Acquisition and Involuntary Resettlement is that resettlement programs should result in the "*improvement of living conditions among displaced persons through the provision of adequate housing with security of tenure at resettlement sites*" (MRC-GIZ 2012 p.90).

²⁷The NA has the authority to initiate, review and pass laws as well as approve state budgets and socio-economic development plans, which have included annual timber harvest quotas. (Constitution, Ch. 4).

The ADB policy on involuntary resettlement (1995) outlines the main issues of relocation, compensation and rehabilitation, drawing on the experiences of many donors in implementing and evaluating resettlement programs. The policy emphasizes avoidance of resettlement wherever feasible and minimization of resettlement when it is unavoidable. It prescribes that all losses of assets, livelihood and income should be compensated for in full, specifying that an absence of formal legal title to land and access to resources should not be a bar to full compensation (NORPLAN and EcoLao 2004).

3.3 Compensation

The development of a particular hydropower project may have direct or indirect impacts (both negative and positive) on the indigenous population. These impacts can occur during different project phases and zones including the planning, construction, operation phases as well as in upstream and downstream areas respectively. It could be for example the construction phase which induces involuntary resettlement and the affected persons may lose their houses, land, crops, animals or economic activities which are the source of their basic income. Moreover, the downstream population can be impacted when the dam is in operation either through soil erosion, the inundation of homes as well as cultivated land; or a reduction of fishing activities and the loss of a source of protein amongst others. In such cases compensation may come in the form of cash, the provision of land for land, or also food.

Unfortunately however according to the World Commissions on Dams (WCD) there are an estimated 40 to 80 million people throughout the world who have been resettled as a result of dams but, "*have rarely had their livelihoods restored*" (WCD 2000 p 129).

Compensation policies and guidelines emphasize the need for in-kind compensation rather than cash compensation for people displaced by large-scale infrastructure projects such as dams and hydropower facilities. In theory, cash compensation at replacement cost allows displaced persons to restore incomes and living standards. However in practice, several obstacles have delayed conversion of cash into replacement assets. Most evidently, the actual amount of compensation may be insufficient to cover the costs. Additionally the timing of compensation can also reduce the likelihood of incomes being restored. Cash may not be convertible into productive assets if markets or opportunities are few. Moreover, local practices may encourage the use of compensation cash to pay debts or for social reciprocities, rather than for purchasing replacement assets (MRC-GIZ 2012 p.92).

An example of the lack of attention paid to resettlement by the project authorities is the recurrence of cases where the number of people to be resettled is underestimated and also the magnitude of this underestimate. In a global comparative survey of 50 dams – induced resettlement in 50 cases, with the statistical assistance of John Gay, the estimates of the numbers of resettled people before and after physical removal during the project's different stages including its identification and approval were only made available in 20 cases. The initial estimate in nine of the cases (73,638 people) turned out to be only 52 % of the later number (140,541). In 12 cases (one of which was among the previous nine cases) the number of people to be resettled which was estimated at the time of project's approval (271,604) was actually only 55 % of the total amount which were counted, in two cases (495,590) during its implementation, and in ten cases once they had been removed. In only two of the 20 cases the final total was actually less than the earlier estimate. This also was

the situation in three other cases out of all of the 50 dams that were surveyed which involved a relatively small number of people to be resettled (120 to 5000) (Scudder 2005 p.68).

3.4 Integrated Resource Development Plans for the Affected Population

The resettlement program normally includes the provision of infrastructure and services to ensure the long-term sustainability of displaced and host communities. This is according to the World Bank's Operational Policy on Involuntary Resettlement which specifies that "*in new resettlement sites or host communities, infrastructure and services are provided as necessary to improve, restore, or maintain accessibility and levels of service for the displaced persons and host communities. Alternative or similar resources are provided to compensate for the loss of access to community resources (such as fishing areas, grazing areas, fuel, or fodder)*"(MRC-GIZ 2012 p.91).

The resettlement process requires a combination or a better balance between compensation and development activities. Moreover, the restoration of living standards require more development activities as legitimate project costs, and the balance between physical resettlement, compensation, and development activities should be continued, such as for example the NT2 Social and Resettlement Program.

The compensation in cash and in kind is of course essential for dealing with such tangible physical assets such as houses and household structures, fields and land for other crops as well as communal property resources. These include wild foods and medicinal plants, building materials, as well as grazing and fishing areas (Scudder 2005 p.130). At the same time consideration should be given to the fair access to economic opportunities such as fishing areas, cereal crops and trees, as well as non-economic assets including public buildings and communal forest areas.

3.5 Indigenous People/Ethnic Minorities

The ADB's policy on indigenous peoples (1998) aims to ensure that indigenous peoples, in the context of Lao PDR called "ethnic minorities", have opportunities to participate in and benefit equally from development. It draws up strategies and approaches that are designed to avoid negatively affecting ethnic minorities in its operations, and to provide adequate and appropriate compensation when a negative impact is unavoidable. Open and transparent consultations are an integral part of this process (NORPLAN and EcoLao 2004).

In the World Bank's OD 4.20 on Indigenous People (1997) transparent and meaningful consultations with directly affected ethnic minorities are required to be undertaken prior to the initiation of detailed project preparation. If ethnic minorities are considered vulnerable groups and are likely to be adversely affected by a project, the borrower is required to prepare indigenous peoples/ethnic minority development plans to mitigate adverse impacts and to promote tailoring of benefits based on the preferences of the people concerned (NORPLAN and EcoLao 2004).

3.6 National Policy

3.6.1 National Policy on Sustainable Hydropower

The formulation of the national policy on sustainable hydropower (NPSH) originates from the World Bank's objective to translate the lessons learned from the Nam Theun 2 project into components of national policies that can promote and guide sustainable hydropower development in Lao PDR. The policy implies a close linkage between government agencies and private investors in hydropower development. It formally fosters the role of hydropower to generate government revenue, promote economic growth and to alleviate poverty. It is founded on economic, social and ecological principles of sustainability.

The NPSH highlights the need for the disclosure of information regarding project reports, assessments, mitigation plans and monitoring reports. Moreover to include environmental assessment as an integral part of hydropower development and to recognize the rights of project affected people. It also advocates a project's compliance to existing policy frameworks so as to ensure sustainable hydropower development. Furthermore it proposes the creation of an Environment Protection Fund (EPF) to tap into a certain portion from hydropower revenue. (STEA, 2005)

The NPSH lacks the institutional framework for the division of tasks/responsibilities, potential joint collaboration and the necessary coordination between different relevant government agencies. For instance, in respect to project affected people, the policy is unclear regarding exactly who is responsible for defining a resettlement plan, and then afterwards approving or monitoring it. Surprisingly, NPSH is formulated and supposed to be implemented by STEA through the Lao Environment and Social (LEnS) project which is funded by the World Bank and not by the Ministry of Energy and Mines and so because of this the Ministry is not regarded as a key actor in hydropower (Suhardiman, De Silva et al. 2011).

The National Water Resources Profile reflects the rationale and reasoning behind the formulation of the draft National Water Resources Policy (NWRP) - August 2010 version. The draft NWRP was formulated to address the existing policy gaps in the Prime Minister's Decree on the Implementation of Land, Water and Water Resources (2001), which was promulgated to implement the Law on Water and Water Resources (1996) (Government of Lao PDR 2008).

A new Ministry of Natural Resources and Environment (MoNRE) was established by the National Assembly of Lao PDR in June 2011. This is a merger of the existing institutions of WREA with parts of the National Land Management Authority (NLMA), the Geology Department, as well as the Protection and Conservation Divisions of the Department of Forestry. It is responsible for water, the environment, geology and some aspects of forestry (MoNRE 2011). However, the new Ministry was not yet operational by the time the fieldwork was conducted and challenges had already arisen because the division of rights and responsibilities among the different departments had not been clarified (LIWG 2011).

3.6.2 Compensation and Resettlement in Development Projects

Decree on the Compensation and Resettlement of People Affected by Development Projects (STEA, 2005)

Decree N°192/PM defines the principles, rules, and measures to mitigate adverse social impacts and to compensate for damages that result from the involuntary acquisition or repossession of land and fixed or moveable assets. This includes a change in land use, a

restriction of the community's access to the natural resources affecting community livelihoods and income sources (Article 1) (Gouvernement of Lao PDR 2005).

The decree consists of 19 articles and article 3 provides the specific definitions of compensation and resettlement related to this decree such as project affected people, project owner and vulnerable groups. Part III and article 6 clearly determine the "compensation principles".

The decree obliges project owners to address adverse social impacts (Article 4) but does not clarify on the procedures/rules to monitor and evaluate the conduct of the project owners' so as to determine whether the measures that were taken met the defined obligations. According to Article 4:

"In collaboration with the concerned local government authorities and organisations, the project owners have the responsibility to carry out necessary surveys and field inventory of impacts measured by types and degree, and determine entitlement to mitigation measures including compensation for affected assets. Project owners must provide appropriate funding to assist, support and relocate the affected people. Additionally they should implement income rehabilitation measures and prepare a necessary plan in an efficient and timely manner which has been approved by the concerned agencies so as to ensure the improvement of their socio-economic situation" (page 5).

However it remains unclear exactly who and by what means the project owners' conduct will eventually be monitored and evaluated.

The decree states that "project owners shall make concerted efforts for an effective public dissemination of information about the objectives of the project and the compensation package that is part of the resettlement process. This should be done through the mass media such as newspapers, radio, TV or public meetings and by other means to inform local authorities at the provincial district as well as village level, organizations of project affected people and the wider public (Article 12; 13)".

It brings to light the legal foundation for wider public involvement in hydropower decision making processes. Furthermore, the decree includes grievance redress mechanisms and the establishment of a grievance redress committee to address complaints and grievances pertaining to land acquisition, compensation and resettlement due to the project (Article 13). Considered from the perspective of public participation, the formation of the grievance redress committee could be viewed as a potential entry point to promote wider public participation and as a channel for public opinion to reach project management.

The decree obliges project owners to prepare an Initial Social Assessment (ISA), a Land and Assets Acquisition Assessment; a Social Impact Assessment (SIA); a Land Acquisition and Compensation Report; a Resettlement Plan; as well as an Ethnic Minority Development Plan, and then submit them to the government agency (STEA) for approval (article 15). It does not elaborate on the process of approval in terms of criteria/guideline for the approval, regular monitoring, and inspection of activities that have been conducted. In addition, the decree's definition of those eligible for compensation does not include a community who lives downstream of the reservoir/dam in terms of the potential project impacts on a downstream area.

In summary, the decree gives the project owners all the responsibility regarding compensation and resettlement issues, without exercising sufficient control by monitoring and evaluating a project owner's conduct at a project level.

Regulations for Implementing Decree 192/PM on the Compensation and Resettlement of People Affected by Development Projects (GoL, November 2005).

In line with the Decree on Compensation and Resettlement of People Affected by Development Projects the regulations link resettlement procedures with the project cycle (Article 3).

Table 1: Project Cycle

Project cycle	Resettlement process
Identification	Screening/Initial Social Assessment (ISA)/ToR for Social Impact Assessment (SIA)
Pre-feasibility study	Re-define ToR/assess options for minimizing adverse impacts/selection of suitable design option
Feasibility study	SIA/Socio-economic Survey (SES)/Inventory of Losses (IOL)/Resettlement Plan (RP)/ Ethnic Minority Development Plan (EMDP)
Detailed study	Updated/final RP/EMDP
Construction/operation	RP/EMDP implementation and monitoring

Source: (Suhardiman, De Silva et al. 2011 p.26)

The regulations outline the procedure for resettlement and compensation and what the project's owners have to do so as to ensure that they comply at each stage of the project's development (from identification to construction and operation). As stated in the regulations:

"To implement each step of the project's cycle and resettlement process, the project owner will properly and strictly comply with the provisions determined in the Technical Guidelines on Compensation and Resettlement²⁸" (page 3) (STEA 2005).

This gives the project owner the central role in the formulation and implementation of a resettlement plan. It highlights how the government perceives the project owner as the decision maker in a hydropower project. In giving the project owner the full responsibility to handle the overall resettlement process it brings to light the potential conflict of interest that

²⁸The guidelines also provide direction in conducting social assessments in projects with indirect impacts on the population within or beyond the project's boundaries. They explain in detail the processes and procedures that are necessary for the collection of data, surveys and the preparation of various documents in accordance with the provisions of Decree 192 on Resettlement and Compensation. They also cover all phases of the project stages from identification to implementation as well as the post-implementation evaluation of resettlement activities conducted by development projects. The current compensation and resettlement guidelines or regulations provide provisions that relate to large infrastructure development projects such as roads, mining and plantation concessions as well as hydropower dams.

might occur in identifying any potential negative impacts, formulating a mitigation/resettlement plan, implementing it and then monitoring the plan's implementation. Given the fact that project owner is interested in establishing the hydropower dam, there is a tendency to downplay the potential negative impacts right from the start. Similarly, given the project owner's pursuit of economic gain from the planned project, there is a tendency to try and minimize the cost of the resettlement plan. Additionally as the project owner's main concern is to generate power rather than to sustain the existing livelihoods of the affected people there is a tendency to overlook the operational impacts on existing ecosystems.

Other issues include the extent to which project owners include public participation, information disclosure and consultation into shaping the overall resettlement process. The regulations highlight the potential role of local authorities in encouraging a more transparent and deliberative decision making through participation and to spur a community into taking an active role in the planning and implementation of resettlement.

3.6.3 Key Differences in Lao PDR Law and World Bank Policies

Promulgation of GoL's compensation and resettlement Decree 192/PM represents a significant improvement in the rights of citizens when their livelihoods, possessions and communities are affected by development projects. Both the compensation and resettlement decree and the World Bank policy on involuntary resettlement entitle the Project Affected Persons (PAPs) to compensation for affected land and non-land assets at replacement cost. However, the actual definition of severely affected PAPs varies between the World Bank (OP 4.12) who considers it to be at 10% and the decree 192/PM (Article 8) which considers it to be at 20% of income generating assets affected. However in accordance with the decree 192/PM (Article 6) all PAPs are entitled to economic rehabilitation assistance to ensure that they are not worse off due to the development project and which also means that it is in line with World Bank policy. *The 10% definition of severely affected will be adopted as part of the M-IWRMP's²⁹ resettlement policy.*

Both the compensation and resettlement decree (192/PM) and World Bank policies entitle non-titled PAPs to compensation for affected assets at replacement cost and other assistance, so that they are not made worse off due to the development project. However Decree 192/PM goes beyond WB's policy as it includes providing PAPs living in rural or remote areas, or PAPs in urban areas who do not have proof of land-use rights and who have no other land in other places, compensation for the loss of land-use rights at replacement cost, in addition to compensation for their other assets and other assistance. Should PAPs be found to be non titled and be required to relocate, the development project will ensure that they are provided replacement land at no cost to the PAPs, or cash sufficient to purchase replacement land (M-IWRM 2010 p.6)

3.7 Legal Framework of NT2 Compensation Policy and Entitlements

The NTPC and the GoL have developed compensation and livelihood restoration and improvement guidelines in the NT2 "Resettlement Policy" and the "Concession Agreement".

²⁹ Mekong Integrated Water Resource Management

These legal and policy documents were based on the previously available GoL legislation and policies and the World Bank safeguard policies. More recently, the ADB's safeguard policies have become relevant, as have the draft National policy and guidelines on resettlement. This Project Lands Resettlement Plan has been drafted and implemented in accordance with the revised Concession Agreement, World Bank and ADB safeguard policies, as well as the NT2 Resettlement Policy (NTPC 2005 d chp:5)

3.7.1 The Constitution (August 14, 1991)

The Constitution is the supreme legal document in Lao PDR and all other legislation must be consistent with its provisions. Some of the articles have been implemented by laws and regulations, but none related to the rights of ethnic minorities have yet been interpreted by the court system. Clearly ethnic minorities and all Lao citizens have the constitutional right to protect their customs, their land and their culture and to enforce such rights against the state if infringed upon. Key articles include: Articles [8, 14, 15, 22, 27, and 28].

3.7.2 The Land Law (October 21, 2003)

The Land Law is the key legislation covering the rights and procedures regarding the framework for tenure, access, use and management of land, including forest land, by villagers and other parties within the project areas. It is based on the Land Law of 1997 with minor amendments. Key articles include: Articles [3, 5, 7, 13, 17, 18, 21, 63, 65, 70, and 71].

These articles illustrate the inextricable involvement of the state in all aspects of the rights of individuals and organizations to land, from granting the tenure under Articles 3 and 43 to the use to which that land can be put under Articles 17, 18, 21 and 22. This governance is performed at both a central and district level through the relevant ministries. The location of the land for the NT2 project suggests that the rights to use are primarily under the control of the Ministry of Agriculture and Forestry.

3.7.3 Land Titling Legislation

To secure the tenure rights of the affected peoples (APs) to their resettlement land, there are the following two issues which must be addressed. Firstly the individual household rights to their homes and agricultural plots and secondly the communal rights of the villagers to the forest land. The Ministry of Finance is currently supported by the World Bank in its process of registration of land parcels in Lao PDR. This has focused primarily on municipal areas where the land titling department systematically registers parcels of land in a town. The implementation of the land titling program is guided by three ministerial directives: MD No. 996/MoF, 24th June, 1998, MD No 997/MoF, 24th June, 1998 and MD No. 998/MoF, 24th June, 1998). The titling of agricultural and housing land for NT2 was performed under the first two MDs, No. 996/MoF and No. 997/MoF.

The NT2 Project, in conjunction with the Ministry of Finance registered the resettlement housing and agricultural land in the name of the individual households (if a couple in the household are married, then the husband's and wife's name appear on the title certificate) using the procedure based on the Ministerial Direction on Systematic Adjudication of Land Use Right No. 997/MoF.

3.7.4 The Road Law (April 3, 1999)

Article 19 of the Road Law states that if road construction work in any of the various classes needs to use the land owned by a private person or by an organization having the right to use it by law, the owner of the land to be expropriated shall receive reasonable compensation.

3.7.5 Nam Theun 2 Resettlement Policy

The NT2 Resettlement Policy (updated 12 July 2002) was issued by Lao PDR Committee for Planning and Cooperation as No. 1147/CPC. It outlines the basic principles and measures governing the resettlement of agricultural and forestry production areas and compensation to the population of the Nam Theun 2 Project zones, with the view of upgrading (in the case of plateau resettlement) and ensuring sustainable livelihoods. It accommodates the participation of the population in the consultation, planning and design process of their new settlement and production areas. It also provides for the application of special measures towards ethnic minorities and vulnerable persons to assist them to take care of their needs and foster self-reliance. Development of a specific NT2 resettlement policy has taken place in parallel with the preparation of the draft national policy. The steps in the process of preparing a NT2 project-specific resettlement policy have been:

- September 1996 - NT2 Resettlement Policy Workshop in Thakhek.
- March 1997 - Review by NT2 Study of Alternatives; review by the GoL Workshop; and discussion by a Public Briefing Session.
- May 1997 – Review by the World Bank Mission.
- June 1997 – Two-day Public Consultation Workshop; review by a Panel of Experts and by an International Advisory Group.
- February 1998 - Approval by the State Planning Committee of NT2 Resettlement Policy.
- January 1999 – Two-day Public Consultation Workshop on Resettlement of Affected People.
- September 1999 - GOL approval of RAP, including NT2 Resettlement Policy.
- November 2001 and January 2003 – World Bank Safeguards Policy Missions.
- July 2002 – Resettlement Committee Policy Adjustment (NTPC 2005 a chp:3 p.11, NTPC 2005 d chp:5 p.4)

3.7.6 Resettlement Committee Regulations

While the NT2 Resettlement Policy (and more recently the Concession Agreement of 2002) is the overarching framework outlining the resettlement principles, it is clearly stated (article 6.2) that more specific regulations are in place which deal with individual procedures for the successful implementation of the policy. Thus, as detailed planning and implementation proceeds, regulations are passed by the Resettlement Committee, at the recommendation of the Resettlement Management Unit and NTPC. These regulations are executed by the Provincial Governor and therefore have the authority of a Provincial Decree. The following Resettlement Committee regulations were issued prior to the signing of the Concession Agreement, and are now incorporated into this Concession Agreement.

- a. Resettlement Committee Regulation Number 1 - Eligibility
- b. Resettlement Committee Regulation Number 2 - Entitlements

c. Resettlement Committee Regulation Number 3 – Impacts on Downstream Areas

Resettlement Committee regulations which have been recently drafted include:

- Agreement of the Provincial Governor (no. 726/PG.KM), as chairman of the RC, to change the census date of eligible resettled plateau residents dated October 27, 2004.
- Regulations on land/assets registration and compensation, dated 15 September 2004; and Instructions (no. 257/PG.KM) of President of Resettlement Committee on Social Order.
- Management and Small Trade during the NT 2 Project Construction Period, dated 26 November 2004.

Also issued at the Central level has been:

Prime Minister's Decision (No. 07/PM, dated 22.01.2005) on Allocation of Land Use Right of to Nam Theun 2 Power Company Limited and the Affected People of the Nam Theun 2 Project (NTPC 2005 a chp:3 pp.11-15)

3.7.7 ADB and World Bank Operational Procedures

The NT2 Resettlement Policy details the guiding objectives, principles and provisions under which resettlement is carried out. This NT2 Policy and the SDP which was drafted over many years, aims to follow the principles of the three applicable ('triggered') WB Policies:

- (i) Operational Policy 4.12: Involuntary Resettlement.
- (ii) Operational Directive 4.20: Indigenous People.
- (iii) Operational Policy 4.11: Cultural Property.

The ADB has also become a partner in the NT2 Project, and thus the ADB safeguard policies are also relevant to the social and resettlement programme of the NT2 Project, including:

- ADB Policy On Involuntary Resettlement (1995) and Operations Manual (OM) F2
- ADB Policy on Indigenous Peoples (1998) and OM F3
- ADB Policy on Gender and Development (1998) and OM C2

For example, the ADB Operations Manual: Bank Policy states, in paragraph 4 (iii)

"Replacing what is lost. If individuals or a community must lose all or part of their lands, assets, means of livelihood ... they will be compensated and assisted through replacement of land, housing, infrastructure, resources income sources and services, in cash and kind, so that their economic and social circumstances will be at least restored to pre project levels"(NTPC 2005 d chp:5 p.6).

NTPC and GoL are fully committed to comply with these WB and ADB requirements and policies for indigenous peoples, involuntary resettlement, cultural property as well as gender and development.

The most relevant Bank procedure with regard to compensation affecting involuntary resettlement due to NT2 project land impacts is the WB's OP 4.12 and the ADB's OM F2, both on Involuntary Resettlement.

The overall objectives of the IFI's policy on involuntary resettlement are the following:

- a. Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs.

- b. Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in the planning and implementation of resettlement programmes.
- c. Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

3.7.8 The Concession Agreement

The Concession Agreement (“CA”) was signed on October 3, 2002 between NTPC and the GoL, represented by the Committee for Investment and Co-operation as it acted for and on behalf of Lao PDR.

The CA was approved by the National Assembly on October 12, 2002. As such the rights and obligations of the GoL and NTPC in relation to social and resettlement issues are approved by the highest legislative body in Lao PDR. Indeed, it is the CA that requires the production of a Project Land Resettlement Action Plan which then needs to be approved by the GoL.

Under this CA, the GoL grants NTPC the right to implement the project on a build, own, operate and transfer basis for a period of 25 years (the “concession period”) following the day that commercial operations began, which is subject to any extensions as a result of Force Majeure.

The GoL and NTPC acknowledge that the project will cause environmental and social impacts in Lao PDR and that NTPC and, where applicable, the GoL will be responsible for addressing, alleviating and/or remedying such impacts.

There are two main sections in the CA that deal with the resettlement of the affected population and set out how the GoL and NTPC will comply with and implement the NT2 Resettlement Policy in order to further the Project’s resettlement objectives: (i) Clause 30 and (ii) Part 1, Schedule 4 (Social Component) -provides details of the obligations of both NTPC and the GoL, the duration of these obligations and institutions within NTPC and the GoL who are responsible for the process. (NTPC 2005 a chp: 3 pp.16-18, NTPC 2005 d chp: 5 p.7)

3.7.9 General Principals of Compensation and Livelihood Restoration

The underlying principle of the NT2 Social and Resettlement Programme is that lost assets, livelihoods and incomes would be fully compensated. In the case of the Project Lands Programme two general types of compensation are possible:

- (i) Payment of cash compensation for lost production, income or fixed assets; or
- (ii) Compensation by way of direct replacement, and/or by rehabilitation or income restoration.

The general principles and process of these compensation types are as follows:

- a. Cash Compensation
 - Generally, based on the real market value at the time of actual land acquisition, assuming that there is a market.
 - If land was recently purchased by the PAP, then the cash payment would be paid upon the proof of purchase of land.
 - Cash compensation could also be based on lost productivity, the total amounting to the accumulation over a 7 year period.
 - The cash payment may be paid out in kind to cover the purchase of equipment, such as a power tiller and trailer for the breeding of cattle or for other inputs that could improve existing livelihoods.
- b. Replacement Land: Provision of land with equal amenity. The project would have to develop the new land and/or provide facilities to ensure the level of productivity of the land for at least the first two years.
- c. Replacement Livelihood: PAPs would be fully supported to undertake enterprises that will generate the same amount of net income as those that were lost. Some examples of the possible replacement enterprises could be the establishment of repair, handicraft or small retail shops. Equipment, training or initial supply of goods for sale would be provided to ensure that income can be generated within a short time and that PAPs are not burdened with additional costs.

Preference would be given to land-based resettlement and livelihood strategies for PAPs whose livelihoods are land-based. Where land-based assets cannot be replaced with land, non-land based options which build upon opportunities for self employment will be provided, in addition to cash compensation for land and other assets lost.

However, choice of the compensation type would be reviewed with each PAP and Project Affected Village and would depend on three main factors:

- (i) The significance of the impact in relation to the remaining livelihood of the PAP family.
 - If for example, the impact is small (<10 % of the PAPs total livelihood), then a 'cash' type of compensation is an acceptable option, although the use of this cash should also be managed.
 - If the impact is significant (that is, the impact would mean loss of more than 10 % of the families land and/or livelihood) then the direct replacement of land or development of alternative livelihoods is the option that will be promoted.
- (ii). The concerns and proposals of the PAPs themselves. If for example the impact is estimated to be more than 10 % of the PAP family's land and/or livelihood, yet they strongly request compensation in cash, then this would be seriously considered, on a case by case basis, by the District Grievance Committee.
- (iii). In cases where replacement, rehabilitation or relocation are not feasible or possible, due to a lack of land or alternative income producing opportunities, then again cash compensation may be considered.

If cash compensation is appropriate, then the project (GoL and NTPC) must ensure that this cash is used in an appropriate and productive manner, or even used directly to purchase useful or production inputs (eg, power tiller, buffalo, fish pond, etc).

If the "land for land", "livelihood for livelihood" or "asset for asset" compensation is the appropriate path to follow, then the project is obligated as follows:

- PAPs have the same entitlement for houses as they did for the Nakai reservoir resettlement, which is either (a) a house of minimum size of 14 m² per person, and made of wood, or (b) if the size of original (impacted) house is larger than this, then at least the new house should be that size and of the same material.
- If the house is larger than this, then the new house should be at least that size and made of the same material.
- In the case of other buildings, there should be a full replacement, as per original building, materials etc,
- In the case of rice paddies, gardens, fish ponds etc, the replacement land (with title) should be of equal productivity or provide a replacement livelihood (NTPC 2005 d chp:5 pp.8-15)

In fact, the NT2 land areas are of various shapes and sizes and the project has identified - for the purposes of analysis and compensation - a total of 66 Land Parcel Areas (LPAs). These LPAs include the previously numbered 58 Project Lands identified in the Concession Agreement (CA) (NTPC 2005 d chp:4 p.1).

There are a range of types of lands, assets and livelihoods (mostly rural), which have been identified as potentially impacted by the need to temporarily or permanently hand over Project Lands. Further details are provided in Table 5-1: Land and Assets to be Compensated which can be found in NTPC (2005) on Social Development Plan report volume 4, chapter 5, (page 8 and 9).

The entitlements of people whose land, assets or livelihoods are affected by the NT2 can be found in the Entitlement Matrix Table 5.2 Table 5.2 Entitlement Matrix - Project Lands on NTPC (2005) on Social Development Plan report volume 4, chapter 5, (page 11 to 15).

4 BRIEF INTRODUCTION TO THE NAM THEUN 2 HYDROPOWER PROJECT

The NT 2 Hydroelectric Project is actually the largest project in operation in Lao PDR, with 1075 MW (6,000 GWh/year capacity installed). Out of this 1000 MW of power is exported to Thailand and an additional 75 MW is produced for domestic consumption as well as for sale to Electricité du Laos (EDL) or EDL-Gen³⁰ (NTPC website 2013). NT2 is one of the most contentious hydropower projects in Lao PDR due to its impacts on the environment and on the local population, which have been the subject of a global debate for more than 15 years (Porter and Shivakumar).

It has become one of the most studied hydropower projects in the world because it is considered to be a best-practice or model dam (Christopher G 2012).

The recent development of Xayaboury Hydropower Project³¹, signalled the first mainstream dam proposed on the Mekong River in the Lower Mekong basin and it will soon be the largest hydropower project in Lao PDR. Located between Xayaboury and Luangprabang province it has become one of the world's highest profile water disputes to date. It is the first of nine dams³² that Lao PDR intends to build on the river's mainstream. Furthermore China has moved forward with its own dams on the upper part of the Mekong basin without consulting its downstream neighbours or sharing water flow data. Five mega-dams³³ have already been built, eight are underway, and there are several more being planned in Tibet and Qinghai (Meade 1996, MRC 2005, Gupta and Liew 2007, MRC 2011 a, Energy Studies Institute 2012, International Rivers web site 2013).

³⁰ Since 1959, Electricite du Laos (EDL) has owned and operated the primary electric generation, transmission and distribution assets in Lao PDR. In December 2010, GoL approved the privatization of EDL's power generation business and the establishment of Electricite du Laos Generation Public Company ("EDL-Gen") as owner/operator. On the December 15, 2010, EDL-Gen became a public company and listed on the Lao Stock Exchange. EDL-GEN is owned 75% by EDL and 25% by public investors (both domestic and foreign).

³¹ This is the first run-of-river dam to be built in the lower Mekong basin, with a capacity of 1,285MW (7,370 GWh/year). It will require an investment capital of US\$3.8 billion and is expected to take eight years to complete (2019). The project is currently about 10 percent complete after a groundbreaking ceremony took place on November 7, 2012 (Latsaphao March 22, 2013 p.2). For background on the Xayaboury Dam, please visit [<http://www.internationalrivers.org/node/2284>]

³² Pak Beng, Luangprabang, Xayaboury, Pak Lay, Sanakham, Lat Sua, Don Sahong and another two in Thai-Laos border areas (Pak Chom and Ban Koum).

³³ The completed Lancang dams include the Dachaoshan (2003), Manwan (2007), Jinghong (2009), Xiaowan (2010), and Nuozhadu (2012).

4.1 Background of the Project

The potential for hydroelectric power projects of the Nam Theun³⁴ (in reference to the river) on the Nakai Plateau was identified as early as 1927 [*Appendix 1: Project Timeline*], but it was not until the mid-1970s that detailed feasibility studies of a project began (ADB 2004). In the late 1980s GoL targeted Nam Theun 2 as a key vehicle for the economic and social development of the nation, including the households living in the districts affected by the project, and invited the World Bank, among others to participate (World Bank 2010 b).

The NT2 project has a long history and has encountered several challenging periods along the way including the dam debate of the 1990s, which culminated in the World Commission on Dams, the Asian financial crisis of 1997, the strengthening of environmental and social safeguard policies and practices at the World Bank and other financial institutions. Additionally there was the era of greater scrutiny of the bureaucratic arrangements for the transparent use of one country's natural resource by another country. The project's unabridged construction finally commenced in June 2005 (Porter and Shivakumar 2010).

The Nam Theun diversion was created in March 2006 and then closed in April 2008 following the completion of the Nakai dam wall. Subsequently the impounding of the Nakai reservoir occurred over the 2008 wet season and the reservoir almost reached its full supply level by the end of 2008. Test hydropower generation began in mid 2009 and then finally **in March 2010** the project's four export production turbines started full commercial operations, supplying the Electricity Generating Authority of Thailand (EGAT) with 1,000 MW of electricity. (World Bank 2012 a, DEB web site 2013, NTPC web site 2013).

Following the many years of consultation, planning, and construction, and about a further 8 months after the start of commercial operations, the Nam Theun 2 Project was officially inaugurated³⁵ in December 2010 in Khammouane province (as shown in Photo 1). The GoL again confirmed the importance of the project to the country's development. President Sayasone expressed his gratitude to the World Bank, the Asian Development Bank as well as other financial institutions and development agencies for their ongoing work on this project and highlighted that:

“the people of Lao PDR take great pride in witnessing the Nam Theun 2 development as one of the most important projects in the country”(World Bank 2012 a p.6).

³⁴ Throughout this report, the words “Nam”, as in “Mai Nam “Xe”, and “Houay” are used for “river” and “ban” for “village”. In order to avoid repetition, the English word is not repeated after the Lao name and therefore “Nam Theun” is used rather than “Theun River”.

³⁵ Lao PDR's President, H.E. Choummaly Sayasone, together with the Thai Prime Minister, H.E. Abhisit Vejjajiva, as well as the President of the Asian Development Bank, Mr. Haruhiko Kuroda, and the World Bank's Managing Director Mrs. Sri Mulyani Indrawati, joined representatives of international organizations, private companies and diplomatic missions at the Nam Theun 2 Power Station to participate in the ceremony.

Project Inauguration Dec 2010



Photo 1: Official NT2 Inauguration Ceremony, December 9, 2010

Source: (CPWF 2012)

4.2 Project Design and Operation

According to the NT2 Concession Agreement NTPC is to operate a build-own-operate-transfer (BOOT) project, which will finally be handed back to the GoL at the end of the 25 year concession period (2009–34). The project includes the development, construction, and operation of a trans-basin diversion power generation system.

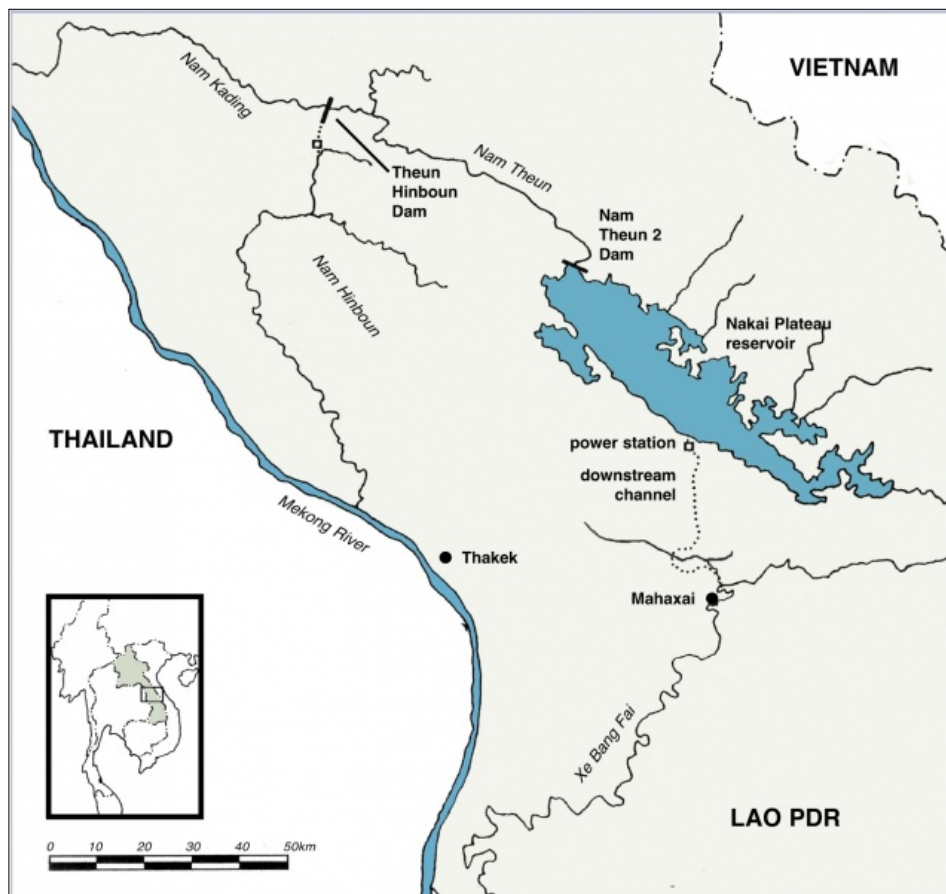
NT2 was built on the Nam Theun, a tributary of the Mekong River, flowing in the central part of Lao PDR³⁶. It is accessible from Vientiane by road at a distance of roughly 430 kilometres. One of the key features of the project is the dam on the Nam Theun at Keng None in Bolikhamxay province [refer to Photo 2 and Map 3].

³⁶ Its geographic footprint is actually imbedded in three provinces (primarily Khammouane province, with some features located in Bolikhamxay and Savannaket provinces).



Photo 2: The Nakai Dam with Spillways on the Nam Theun at Keng None

Source: Resettlement Committee of NTPC, 2010



Map 3: Nam Theun 2 Dam Construction Site

Source: <http://www.internationalrivers.org>

This dam created a reservoir on the Nakai Plateau with a maximum inundation of 450 km² (3.5 billion m³) at Full Supply Level (FSL), reducing in size to about 82 km² when it is at its

Minimum Operating Level (MOL). The Nakai reservoir has a catchment area of 4,013 km², most of which is situated in the Nakai Nam Theun National Biodiversity Conservation Area (NNT-NBCA)³⁷(NTPC 2005 a Chapter:2 p.1; NTPC 2005 e Chapter:4; WREA 2010).

NT2 is a trans-basin-diversion project which especially affects the Nam Theun and Xe Bang Fai [see *Figure 1*]. As much as 93 % of the Nam Theun is conveyed through the reservoir and flows through an intake structure³⁸ and then into a headrace tunnel [see *Photo 3*]. The water then drops about 350 meters along a vertical pressure shaft which has been cut down through the rock escarpment from the reservoir [see *Box 1*]. It is then pushed through a horizontal pressure tunnel before entering the turbines in the powerhouse [see *Photo 4*].



Photo 3: Headrace Channel with the Location of the Water Flow Intake of the Headrace Tunnel.

Source: Resettlement Committee of NTPC, 2010

³⁷ The system of National Protected Areas (NPA) in Lao PDR, also known as the National Biodiversity Conservation Areas (NBCAs), was legally established in 1993 through the Prime Minister's (PM) Decree No. 164. Currently a total number of 21 NBCAs and 2 corridors have been declared and the total area within the NBCA system covers more than 3.5 million ha, which almost amounts to 15% of the country's land area. In addition to the established NBCAs, there are many provincial and district level conservation and protected areas established countrywide, which together constitute more than 20% of the total land area.

³⁸ Located about 40 km upstream from the dam which leads into the diversion tunnel excavated in the Phu Ark escarpment.

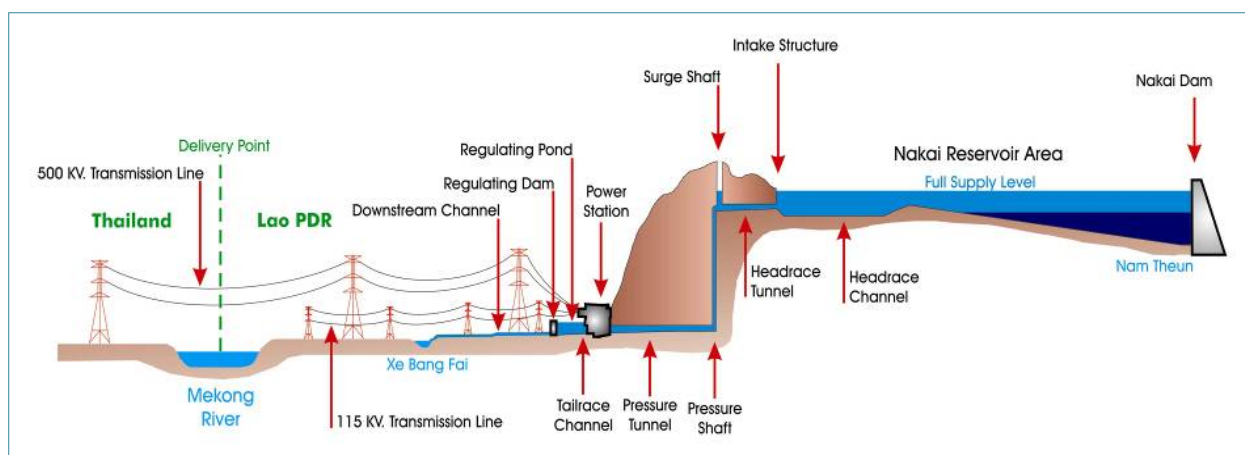


Figure 1: Nam Theun 2 Hydroelectric Schematic Diagram (NTPC 2005 a chp:2 p.3)

Box 1: Features of the NT2 Project include:

- A 39 metre-high, 436 metre-long concrete gravity dam with integrated spillway.
- A 450 square kilometre reservoir and 3,530 million cubic-metre active storage area. A 4,039 square kilometre catchment area.
- An average net head of water of 348 metres.
- A powerhouse comprising 4 x 250 MW Francis turbines (for the supply of power to EGAT) and 2 x 37.5 MW Pelton turbines (for the supply of power to EDL), from which the water flows into the Xe Ban Fai.
- A 70 kilometre-long, single-circuit 115 kV transmission line to Lao PDR's domestic grid.
- A 130 kilometre-long, double-circuit 500 kV transmission line to the Thai border (built and funded by EGAT).



Photo 4: The Nam Theun 2 Power Station, Viewed from the Tailrace Channel.

Source: Resettlement Committee of NTPC, 2010

This powerhouse is located at the foot of the escarpment, near the town of Gnommalat. The water passing through the powerhouse exits into a tailrace channel which leads into a regulating pond and regulating dam. These are located north of the upper Nam Kathang,

and then the water is directed into a 27 km long purpose built downstream channel that flows into the Xe Bang Fai [Photo 5 and Photo 6]. This then eventually joins the Mekong River, about 150 km downstream of the Nam Theun /Nam Kading.

NT2 was expected to provide 12 percent of the active storage capacity in the Mekong Basin in 2010 and 7 percent in 2025 (Leechuefoung 2006 p.15).



Photo 5: View of the 27 km Man-made Channel Flowing Down from the Powerhouse/Regulating Dam to the Xe Bang Fai

Source: Resettlement Committee of NTPC, 2010



Photo 6: Confluence of Project's Water Channel and the Xe Bang Fai.

Source: photo by (McDowell, Scudder et al. 2010 p.25)

4.3 Financing and Project Developers

The Nam Theun 2 multipurpose development project (NT2) is larger and more complex than any other hydropower project in Lao PDR. It is jointly implemented by the Nam Theun 2 Power Company (NTPC) and the GoL who signed agreements with public and private

lenders and guarantors to complete the financing arrangements for the NT2 project. There are 27 international banks, including International Financial Institutions (IFI) such as the World Bank Group (WBG), the Asian Development Bank (ADB), the European Investment Bank (EIB) and Agence Française de Développement (AFD), involved in the financing of the project (World Bank 2012 a).

The first estimate with the equivalent value of US\$1.45 billion (excluding bonding facilities) in US dollars and Thai baht has been committed by the financing partners to fund the base project cost of US\$1.25 billion and US\$200 million for contingencies. The NT2 project represented a huge financing challenge, which was met through cooperative, complementary efforts tapping into both public and private resources. NT2 remains the largest foreign investment in Lao PDR to date. At the time, it represented the world's largest private financial investment in cross-border power; and it remains one of the largest internationally financed independent power projects in Asia since the financial crisis of the late 1990s.

NT2 has been developed as a build-own-operate-transfer (BOOT) project by the Nam Theun 2 Electricity Consortium and the GoL. The Nam Theun 2 Power Company Limited (NTPC) is established under Lao law as the owner of the facility. The shareholders of NTPC are made up of:

- EDF - Electricité de France (35%), as project shareholder (EDF International) and head contractor³⁹;
- LHSE- The Lao Holding State Enterprise⁴⁰ (25%) as project shareholder;
- EGCO -The Electricity Generating Public Company Limited⁴¹ (25%), as project sponsor and shareholder, as well as technical services and personnel management provider (through its ESCO subsidiary); and
- ITD - Italian-Thai Development Public Company Limited (15%).

The total base cost for NT2 amounting to \$1.25 billion was disbursed by October 2009. Nam Theun 2 Power Company (NTPC) expected that the final NT2 project costs up to the eventual date of commercial operations (which occurred on April 30, 2010) would amount to \$1.29 billion. This was an increase of \$40 million over the base cost but well below the cost, including contingencies, of \$1.45 billion which had been estimated earlier. These estimates proved reliable and the additional funding was drawn from the contingency budget, which had already been arranged (Porter and Shivakumar 2010; NTPC web site 2013)

³⁹ In addition to supplying financial backing and coordinating the construction of the project, EDF also supplies technical services and personnel management to NTPC. As an energy market leader in Europe, the EDF Group is an integrated energy company operating in all branches of the industry: generation, transmission, distribution, and the trading and sale of energy. [www.edf.com]

⁴⁰ LHSE is a state-owned company, established in February 2005 to hold the Lao government's shares in NTPC. LHSE was created as the entity through which the government's Nam Theun 2 revenue will pass. LHSE replaced EDL as the government shareholder in NTPC. [www.laoholding.com]

⁴¹ EGCO was established in 1992 in accordance with the Thai government's privatization policy for the energy sector. The first independent power producer in Thailand, EGCO was created to acquire some of EGAT's assets and to provide the generating capacity as well as electrical energy to EGAT under long-term power purchase agreements. [www.egco.co.th]

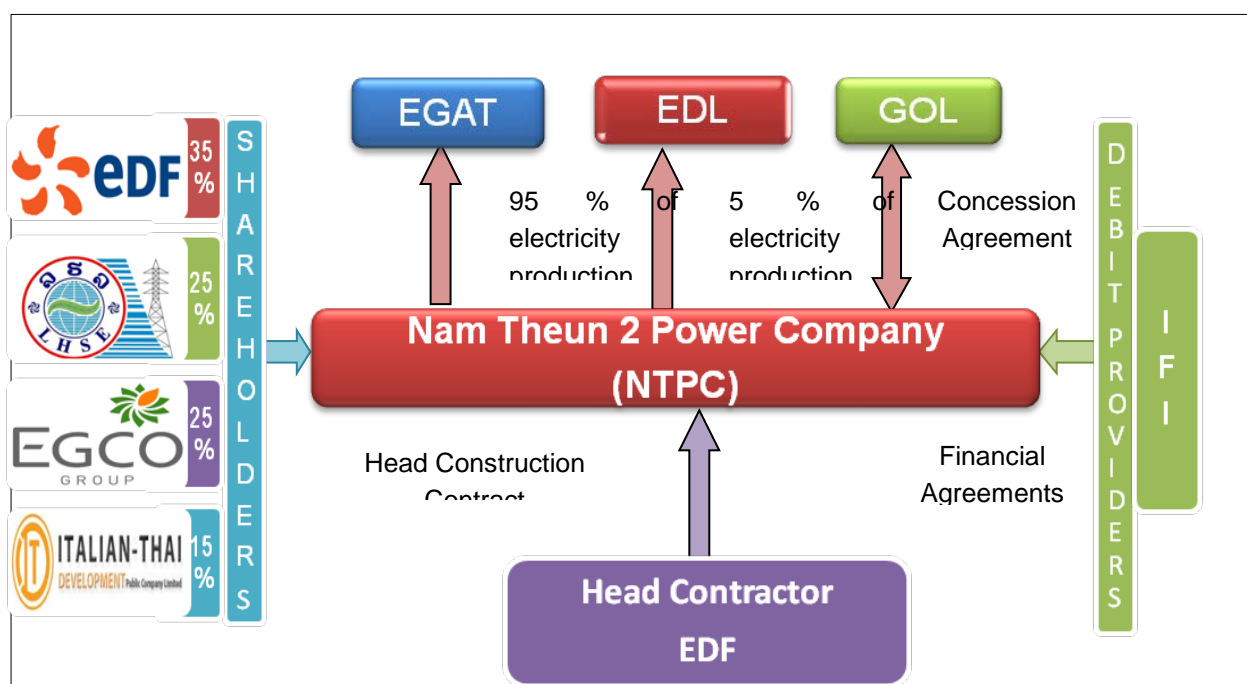


Figure 2: Nam Theun 2 Dam Contractual Structure

Source: NTPC Website 2013

The World Bank's decision to approve the NT2 project was preceded by careful consideration of the project's substantial preparation stage, which involved almost a decade of study and risk evaluation. It took into account the valuable lessons learned from past projects, the intense consultation process, the due diligence on environmental and social impacts, as well as the project's economic costs. Currently both public and private entities are closely monitoring the project's implementation through a coordinated programme.

4.4 The Role of the WB and ADB in Supporting NT2

The WBG and ADB, along with AFD, EIB, Promotion et Participation pour la Coopération Economique (PROPARCO), and Compagnie Francaise D'assurance Pour Le Commerce Extérieur (COFACE) have all supported the Nam Theun 2 project because of its enormous potential for stimulating growth, poverty reduction and environmental protection in Lao PDR. While the bulk of the US\$1.45 billion investment came from the private sector, the entire project has been implemented in accordance with the safeguard policies of the WB and ADB. Furthermore the WB and ADB operate a joint NT2 implementation support and supervision team from their offices in Vientiane. The team, including both international and Lao staff, travel regularly to different parts of the project site to observe its progress, as well as talk to local communities, Government officials and NTPC staff. Since one of the core approaches of the NT2 project is adaptive management, one role of the WB and ADB team is to pro-actively identify problems and agree with Government, NTPC and when applicable other overseeing agencies by what means they should be resolved. The WB and ADB also closely monitor project implementation to ensure compliance with their safeguard policies, as

well as provide technical advice on development topics if needed. Finally, as public institutions, the WB and ADB also play an important role in providing information about the NT2 project to the outside world (World Bank 2010 p 2).

4.5 General Role and Benefits of NT2 in Lao PDR

GoL believes that the production and export of hydropower will bring numerous benefits to the country. Primarily it will boost revenues, which can be used to alleviate poverty and improve the standard of living of the average Lao citizen (DEB web site 2013).

Increased revenues from hydropower projects can be committed to:

- The expansion of health, education and other social services.
- Improvements in transport, communications, water supply, rural electrification and other infrastructure.
- Increasing the resources of GoL's environmental agencies to improve the effectiveness of their protection programmes.

Broad improvements in the national economy resulting from stronger national accounts will generate employment opportunities and create wealth. Within depressed rural areas this will reduce dependency on "slash and burn" cultivation, poaching, excessive fishing and other unsustainable practices.

Direct investment by developers in project areas will boost local economies and it creates employment during construction. A more lasting legacy will be improved local infrastructure and upgraded workforce skills. Benefits accruing from hydropower may include rural electrification, improved roads, hospitals and education facilities, the development of agro-forestry and potential dry-season irrigation, as well as skills development and job creation.

Using a regular supply of water and cheap electricity, rain-fed paddy land can be replaced with irrigated paddy and cash crops. Head ponds and reservoirs can be stocked with fish and these resources can be managed to ensure that they are not over fished. The community's health and nutrition status will also improve as part of a gradual improvement in socio-economic conditions.

The expansion of the country's electrical transmission system will widen the availability of cheap and reliable electricity, potentially stimulating industrialization in rural areas and raising the quality of life of the populations affected (DEB web site 2013).

NT2 is a key development project for Lao PDR which has provided significant benefits to facilitate poverty alleviation in Lao PDR including:

Table 2: Direct Benefits from NT2

Local level	National level
✓ Major improvements in living conditions for around 6,300 resettled people.	✓ Contribution of US\$1 million/year for the protection of a 4,000 km ² national protected area for the 30 year construction and operations period.
✓ US\$ 16 million budget allowance for a large development programme for	✓ NT2 will generate US\$2 billion for the GoL (during the concession period of 25 years) or an average of US\$ 80 million/year. These revenues may be used

<p>villages in the downstream areas of the project (Nam Theun-Nam Kading and Xe Bang Fai).</p> <ul style="list-style-type: none"> ✓ US\$ 85 million budget allowance for social and environmental development programmes. ✓ More than 8,000 employees were hired during the construction phase, made up of 80 % Lao and 60 % local people. ✓ 270 km of road (new and rehabilitated) were constructed by the project including 150 km of national and 120 km of local roads. 	<p>to improve living conditions, health care, education, provide access to roads and electricity in poor and remote areas contributing to poverty reduction as well as environmental protection.</p> <ul style="list-style-type: none"> ✓ At the end of the concession period, the project facilities will be transferred to the government free of charge. ✓ NT2 revenues will make a contribution of about 3% of GoL's total revenue during 2010 -2020 and around 5 % throughout the 25-year concession period after debt servicing. ✓ Nam Theun 2 also provides a practical demonstration of environmentally and socially sustainable hydropower at a time when the hydropower sector is growing rapidly.
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Source: (Balll, Elston et al. 2005, IRN and Environmental Defense 2005, NTPC 2005 a, World Bank 2012 a).

4.5.1 Nam Theun 2 Revenue Management Arrangements

The implementation of revenue management arrangements (RMA) have helped Lao PDR to put in place tools for the transparent and accountable management of public resources. It has allowed the Government to develop a budget classification and monitoring system capable of reporting expenditures on budgetary outlays. The sector ministries have put in place systems for reporting the physical progress of expenditures, and the State Audit Organization is building its capacity to conduct performance audits. In April 2011 the State Audit Organization also published a summary of findings from the audit of the budget execution reports for FY 2008/09 in the local press – for the first time in recent history. The government has also implemented a treasury single account framework managed by the recently established national treasury.

With the NT2-RMA now in place, and eligible programmes identified the current focus is on refining reporting modalities and coordination mechanisms. Implementation of the programmes has already started. The various agencies involved are retaining information on the physical progress of the projects and have been reporting to the Ministry of Finance (MOF). MOF provided a financial flows statement for FY2009/10 in February 2011 and is now developing the NT2 financial project performance report. The reporting format and coverage is under discussion. Furthermore, it will be important to maintain focus on assuring “additionality” particularly in the case of social sectors which have historically experienced fluctuations in recurrent budgets as a percent of the total recurrent budget. At the same time, internal coordination mechanisms between MOF, the Ministry of Planning and Investment (MPI), sector ministries, and the State Audit Organization need to be strengthened to ensure that all respective agencies remain current on the requirements and commitments within the NT2 RMAs (World Bank 2012 a).

4.5.2 Initial Resource Usage Charges

NTPC has been paying resource usage charges (royalties) and dividends to GoL since the onset of commercial operations. The GoL financial year runs from October 1 to September 30, and during the first partial financial year of operations NTPC paid US\$5.4 million to the government in royalties. During FY 2011, the first full financial year of operations, NTPC paid around US\$19 million in royalties and dividends, and is projected to pay around US\$27 million during the current financial year. This does not include the one-off GoL contingent equity release, which will result in an additional US\$14 million of government revenues during this financial year. The funds are transferred by NTPC to the Bank of Lao PDR, which in turn deposits the money into the national treasury designated account. The government has made allocations⁴² for eligible expenditures across the health, education and environmental sectors as well as for rural roads and electrification (World Bank 2009, World Bank 2012 a p.29).

More progress is needed in improving the budgeting for the social sectors. The focus thus far has been mostly on identifying projects within the health and education sectors that are eligible for NT2 revenues. Looking ahead there is the need to consider more measures that are aimed at improving the general budgeting for the social sectors including:

- (i) Developing appropriate budgetary norms for the health and education sectors collaboratively with sector ministries and the counterpart provincial departments.
- (ii) Progressively implementing a complete functional classification for the social sectors.
- (iii) Integrating the recurrent and investment budgets, including the personnel budgets.
- (iv) Developing appropriate monitoring and evaluation tools to ensure that the objectives and outcomes can be evaluated. These measures will ensure that progressively the focus for NT2 revenue management arrangements would transition from specific projects to considering results at the sector level within the country systems perspectives (World Bank 2012 a p.29).

4.5.3 The Public Expenditure

The Public Expenditure Review (PER) and Public Expenditure and Financial Accountability (PEFA) assessment were concluded in 2011 in close collaboration with the authorities. The PER and PEFA analyzed reform performance and provided input into the government mid-term review of the Public Finance Management Strengthening Program, under which the NT2 RMA's are being implemented. The PER reviewed the Government's implementation of the NT2 RMA and concluded that the Government has put in place the core systems for managing and reporting on NT2 revenues. However, there is need to further:

⁴²The GoL has developed indicative allocations for priority sectors, which have been approved by the legislative assembly for use by eligible programmes as part of the FY 2009/10 budget cycle. These are: (i) education 35 %; (ii) rural roads 30 %; (iii) health 20 %; and (iv) environment and forestry 15 %. These allocations will be adjusted in the future, depending on performance.

- (i) Strengthen inter agency coordination and collaboration on revenue allocations and reporting.
- (ii) Develop a results framework to measure the impact of programmes.
- (iii) Improve budgeting for the social sectors so that over the medium term the focus on NT2 RMA can shift from being project specific to become more sectoral (World Bank 2010 a).

4.6 NT 2 Social and Environmental Impacts and Monitoring and Evaluation

The construction and operation of the NT2 project has created environmental and social impacts on the Nakai plateau (a 450 km² seasonally variable reservoir) and in the downstream areas of the Nam Theun and Xe Bang Fai⁴³[see Map 4].The key impacts will be examined on each of the following significant zones:

4.6.1 Reservoir Area on the Nakai Plateau

4.6.1.1 Physical and Environmental Impact of the Inundation

The immediate impact of the inundation to create the reservoir on the Nakai plateau was on the affected forests, wood lands, agricultural land, some wetlands, as well as the terrestrial and aquatic life that was inhabiting the area.

The NT2 reservoir is responsible for enormous amounts of greenhouse gas (GHG) emissions, which amount to as much as one million tons of methane and carbon dioxide per year, according to recent independent academic studies, including a statistical assessment produced by the American Duke University. However it should be noted that this study was conducted within the first three years of the project and therefore the GHG levels would have been relatively high due to the recently decomposing vegetation. The GHG emission levels will reduce over time as the inundated vegetation has decomposed already. Recently, researchers from Toulouse University in France concluded that NT2 produces in excess of 40% of the GHG that would be emitted from a coal fired power plant with an equivalent energy output, and far more than a natural gas-fired plant (Boh 12-13 April 2013). Over a 20-year period the estimated carbon losses in the form of CO₂ and CH₄ were dominated by the outlet fluxes of dissolved gases.

About 60 % of the Nakai plateau was covered by forest of variable quality, ranging from undisturbed to highly disturbed. A natural habitats accounting assessment identified the forest types that would be lost to inundation. These still contained animal species that were important from a conservation perspective, including the Asian elephant, the white-winged duck, and several other kinds of bird species (Porter and Shivakumar 2010 p.55).

⁴³The inter-basin transfer of water from the Nam Theun to the Xe Bang Fai, with associated changes in flow patterns and aquatic ecology; and the construction of project ancillary works.

4.6.1.2 Social Impacts Related to the Nakai Reservoir

There are 17 recognized villages⁴⁴ on the Nakai Plateau, out of which 15 were fully affected by the reservoir's inundation and 2 villages were partially affected (Ban Phonphanpek and Ban Oudomsouk). The NT2 project necessitated the relocation and livelihoods rehabilitation of the inhabitants of these 15 -17 affected villages, amounting to roughly 1,100 families or 6,300 villagers on the Nakai plateau and channel (excluding the downstream areas of Nam Theun and Xe Bang Fai). These communities on the plateau were also impacted by the construction activities on the project land, which included the Nakai dam, headrace channel, intake structure, the relocated section of Road 8b and some tunnel work (NTPC 2005 b, NTPC 2005 c chapter:2 p.2, Christopher G 2012 p.11).

Ethnic Composition

The communities on the Nakai plateau included the following different ethno-linguistic groups: Makong/Brou (36 %), Tai Bo (32 %), Upland Tai (9%), Phou Thay (7%), Vietic (3 %), Sek (1 %) and the other 12 % consisted of Lao, Khmu, Hmong, Lue, Nyuan etc..⁴⁵ (NTPC 2005 b chapter:3 p.3, NTPC 2005 d chapter:4 p.2). The communities were dependent on shifting cultivation, hunting and gathering of timber and non-timber forest products, fishing, livestock, and wage labour.

Income

Only 17 % of the families could produce sufficient amounts of rice for the year, and 50 % suffered because of rice shortages for more than six months of the year. The average household income was 462,000 LAK equivalent to USD \$462 in 1996 (both in terms of cash and imputed) and 1,868,860 LAK equivalent to USD \$449 in 1998. This was well below the national poverty line of \$800 per year (NTPC 2005 b chapter:4 p.2). The social conditions were similarly insecure as more than 60 % of the population had not received any education and the average distance to the nearest health facility was 11 Km, which was usually reached on foot (NTPC 2005 g)

Loss of Houses

The inundation affected houses in 16 out of the plateau's 17 villages. In Oudomsouk, about 94 houses (1998 figure) were affected but none of the houses in Phonphanpek were inundated as they are located above the 540 EL. However in the other 13 villages, all of the houses were affected and villagers were therefore entitled to the full relocation package (NTPC 2005 b chp:2 p.2)⁴⁶.

⁴⁴A total of 31 enclave hamlets are located within the NT2 Watershed/National Protection Area.

⁴⁵World Bank's Characteristics of Indigenous Peoples (OD 4.20, 1991) and the Asian Development Bank's Policy on Indigenous Peoples (1998) apply to the four main minority groups living on the project lands: Vietic Groups, Hmong, Brou/Makong and Bo.

⁴⁶Volume 2 – Chapter 2: Baseline Data – Nakai Plateau

Loss of Agricultural Land and Vegetable Gardens

In 2002 the rice farming practices of the 17 villages on the Nakai plateau included a total area of 91 ha under rice paddy cultivation in the wet season (seven villages), and 35 ha in the dry season (5 villages)⁴⁷. The productivity of these rice fields was very low as it was averaging at 1.1 t/ha for paddy and at about 0.55 t/ha for upland rice. As indicated, the villagers also cultivated about 434 ha of upland rice (by 15 villages), as well as about 86 ha of corn, 49 ha of cassavas and 4 ha of vegetables (NTPC 2005 b chp:1 p.10)⁴⁸.

Loss of Fishing Grounds

Fish harvested from the Nam Theun and its tributaries were the main source of protein for the communities on the Nakai plateau. Fish were caught for household consumption and for sale, and contributed to 6 and 4 % of total imputed and cash income, respectively, in 1998. Fresh fish are consumed during the rainy season; in the dry season, villagers rely to a greater extent on dried and fermented fish. All kinds of fish are caught for human consumption, with catfish and carp species being the most common. Occasionally, a large fish or a substantial catch may be sold in village market or at roadside stalls. Fish, in this context, refer to aquatic organisms of which finfish are usually predominant. Small-mesh nets and traps catch many invertebrates, all of which are eaten.

While their previous fishing grounds were lost due to the inundation, the Nakai reservoir has been a productive alternative resource and has more than compensated for this loss (NTPC 2005 b chp:1 p.11).

Loss of Cultural Heritage

According to the preliminary surveys which were conducted there were no archaeological or historical sites located in the inundated area. However, a few of the villages did have temples, which were then moved to the new village according to specific cultural procedures. Most of the graves were flooded, but villagers did confirm that they preferred to leave the graves in their original location once that appropriate ceremonies and offerings had been made for the ancestors' spirits. It is possible for these spirits taken from NTPC be relocated as long as the proper procedures are followed (Sparkes 1997).

Loss of Lifestyle

Villagers' lifestyles have been affected by the impact on forest land such as the use of timber for construction, firewood and NTFPs collection. (Please refer to the EAMP for detailed information on the loss of forests) (NTPC 2005 chp:1 p11). Village forests have been established but this wood is sold and is not used for the villagers' construction purposes. Firewood can be collected from these forests but there are restrictions as none of the wood can be cut down. Villagers have been encouraged to stop using firewood for cooking and to use electricity and gas instead. A programme has also been established for the growth of NTFPs in the village forests to compensate for the loss.

⁴⁷Nakai District Agricultural Office Rice Production Survey, 2002

⁴⁸Volume 2 – Chapter 1: Geographical Framework, Description of Impacts and Entitlements

The villagers' access to forest land has been seriously reduced since the project as it has now been restricted to the village forests and they are prohibited from accessing the Nakai Nam Theun NBCA.



Map 4: Project Zones -

Source: <http://www.poweringprogress.org>

4.6.2 Nam Theun Watershed

The NT2 watershed, comprising the Nakai Nam Theun (NNT) National Biodiversity Conservation Area⁴⁹ and the Hin Nam No corridor leading to Hin Nam No NBCA and also Pou Hin Poun corridor leading to the Phou Hin Poun NBCA is an area of national and international importance for biodiversity (NTPC 2005 e). The NNT-NBCA is the largest of Lao PDR's twenty-one NBCAs and is not only one of the country's most important biodiversity conservation areas but also one of the most important protected inland areas in Asia. It is known for its quality and diversity of ecological habitats, which includes the populations of many rare, endangered and vulnerable species. Due to the fact that the watershed is contiguous with areas of international conservation status on the Vietnamese side of the border, it has been presented with both important opportunities and challenges.

About 5,800 people, out of whom 90 % are members of the indigenous Brou, Phong, Kri, and Sek groups, lived in 35 villages within the NT watershed. In addition, the peripheral impact zone adjacent to the watershed (North, South, and West of the protected area) is home to 54 villages with a total estimated population of about 22,500 with household income levels well below the national poverty line. Previously most of the villages practiced shifting cultivation and collected non-timber forest products, including wildlife. They had limited access to infrastructure and social services, including health care (Porter and Shivakumar 2010 p 58, Gray 2012 p 6).

4.6.3 Xe Bang Fai Basin

The Xe Bang Fai has a total catchment area of 8,500 Km² and the length of its main stream is 190 km. An important tributary the Nam Ngnom/Kathang which is 38.5 km long, drains into it in Gnommalath district in Khammouane province and this area consists of around 125 km² of freshwater lakes, rivers, ponds, rice paddies and some freshwater marshes,. It is believed that the constant year round discharge of 13,623,552,000 m³ which is released from the Nam Theun powerhouse will change the river morphology of the Xe Bang Fai from Mahaxay to the confluence with the Mekong. Actually, the Xe Bang Fai has been providing water for irrigation, fishing, and household use for some 100,000 people. The water quality has been good, with adequate amounts of dissolved oxygen and low levels of turbidity. NT2 was expected to have a significant social and environmental impacts along the 27 km man-made downstream channel which then connects with the Xe Bang Fai (WEPA web site 2012 , FAO web site 2013).

4.6.3.1 Environmental impact

NT2's Discharge into the Xe Bang Fai and its Impacts on Hydrology

Approximately 7,000 Million Cubic Metres (MCM) per annum is diverted from the Nakai reservoir through the power station into the Xe Bang Fai, which almost doubles its annual flow at Mahaxay, from 8,370 MCM to 15,370 MCM (based on hydrological information gathered from 1989 to 2002). While the maximum rate of discharge from the NT2 is around 330m³/s, the NT2's average annual discharge is approximately 220 m³/s, with there being

⁴⁹Originally it was 351,173 ha but 12,459 ha were lost through the NNT-NBCA which amounts to 3.55 %.

variations over the weeks and the seasons. A minimum discharge of 30 m³/s is maintained in the downstream channel when the power station is not in operation (Rex 16 October 2011, NTPC 2005 c chp:4 p.4).

The impacts on the Xe Bang Fai's flow and water level are expected to be the greatest in Mahaxay, which is the first major settlement downstream of the Xe Bang Fai's and downstream channel's confluence. Further downstream of Mahaxay, as more tributaries join the Xe Bang Fai and where the river channel generally increases its dimensions, the impact of the NT2 discharge on the flow and water heights gradually diminishes. For example, the mean NT2 project discharge of an additional 220 m³/s would increase the water level by approximately 4.9 m in April and by 5.8 when the NT2's discharge is at its maximum. (NTPC 2005 c chp:4 p.6).

Flooding in Mahaxay District

Flooding of the area has occurred under natural conditions and in Mahaxay the bank over flows on average approximately once in every 2.3 years. As the Xe Bang Fai's banks are deeply cut it can carry a discharge of 2,000 m³/s or more without flooding. Therefore, apart from the flood periods, the river is large and deep enough to accommodate the NT2's discharge for most of the year. During the flood periods the additional water that enters the Xe Bang Fai from NT2 does not increase the frequency or height of these floods as there is an agreement with EGAT that allows NT2 to cease generating electricity and therefore halt the discharge, when the Xe Bang Fai is close to bursting its banks (NTPC 2005 c chp:4 p.8).

Flooding in the Lower Xe Bang Fai

In order to quantify the impacts of the project's discharge on the existing flood regime in the lower Xe Bang Fai area two mathematical models were constructed by SMEC. These consisted of a hydrologic model of the whole Xe Bang Fai up to the Mekong, and a hydrologic model of the Mekong and of the Lower Xe Bang Fai (SMEC, 2004).

The models initially indicated that 5,230 ha of land would be put under more than one meter of water because of the additional release of 315 m³/s, with an average duration of 4 days per year. Agricultural production in these areas is likely to be impacted. For instance an additional, 1,530 ha of land would be flooded due to the discharge with an average duration of 4 days per year. However, these areas would be under less than 50 cm of water, and therefore would not threaten rice paddy production. Furthermore, it is possible that an extended period of a flood event by an average of 4 days per year, could put some 2,497 ha of land at risk, with water levels varying from 0.8 m to 1 m (NTPC,2005 c chp:4).

Actually, there are around 150 villages along or close to the Xe Bang Fai that have over the years been regularly been impacted by the river flooding. In order to avoid NT2 exacerbating the floods, the NTPC has a contractual obligation to cease power production when pre-defined flood risk levels are reached in the Xe Bang Fai. The NT2 power purchase agreement with the Electricity Generating Authority of Thailand (EGAT) recognizes this obligation, and there are no penalties for NTPC ceasing operation under these circumstances.

In 2011, NTPC ceased generation in early July and again on August 2nd and did not restart for almost a month following some particularly extreme weather in Khammouane. The Xe Bang Fai is very significant for NT2 as it receives the water discharged from the hydropower

facility when it is in operation (Rex October 16, 2011, Rex August 18, 2009 ,Times Reporter August 26, 2011). At the same time, NT2 has to release water downstream of the Nakai dam due to the extreme fluctuations of the incoming flow (as is indicated in Figure 3 below).. While the water released from the Nakai dam has not caused a loss of life or injury, it has impacted the property of the villages downstream of dam. Since NT2 management followed the operational protocol that is in compliance with the CA and did not exacerbate the natural floods, the project is not liable to pay compensation. However there are ongoing discussions with GoL regarding the possible ways to help the affected villagers.

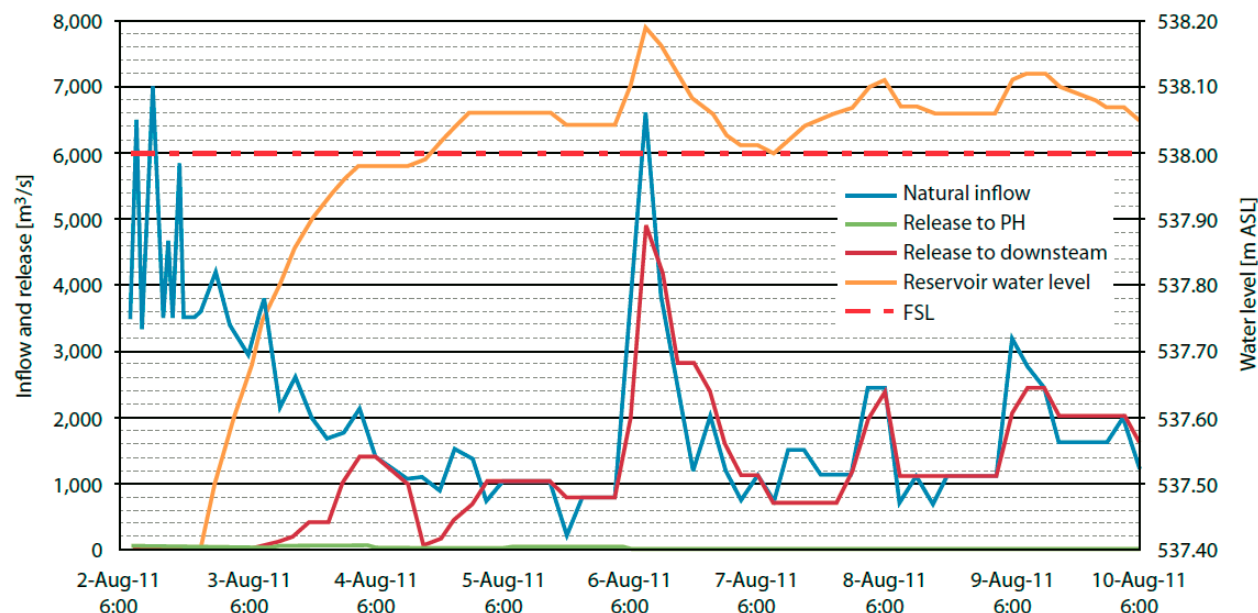


Figure 3: Nakai Dam Water Release Management August 2011

Source: Chart prepared by NTPC

Erosion and Sedimentation of the Xe Bang Fai's Riverbanks

It was anticipated that the erosion rate of the Xe Bang Fai's riverbanks would increase as a result of NT2 because of: (i) increased discharges and water levels; (ii) increased water level fluctuations during the weekends when discharges from the re-regulation pond fluctuate, and (iii) increased flow velocities and shear forces. The main section of the river that is impacted is the first 45 km downstream of the confluence with the Nam Phit which was described in 2002 as follows:

"It is expected that the riverbank will retreat to varying degrees as a direct result of increased discharges from NT2, both as a result of the increased erosive potential of the flow and due to the heightened impact of bank instability. In some places the retreat may be as much as 10 m in the initial active period (a river widening of around 20 m)(SMEC 2002).

The erosion and sedimentation together with the increased depth of the Xe Bang Fai have significant impacts on aquatic habitats and the productivity of aquatic life. Aquatic habitats such as riverbanks, sand banks, deep pools, and rapids have been altered. It should be noted that deep pools are the most important fishing grounds in rivers such as the Xe Bang Fai. One would assume that these pools were at least partially filled in after the start of operations of the powerhouse (NTPC 2005 c chp:4 pp.15-16).

Impacts of NT2 Reservoir on Xe Bang Fai Water Quality

An important water quality parameter that changed in the Xe Bang Fai after the Commercial Operation Date (COD) was temperature. It changed because of the difference in altitude between the reservoir and the Xe Bang Fai, as, the water that is discharged from the NT2 powerhouse is approximately 3°C cooler than the water in the river.

The NT2 reservoir has a low average depth and virtually no pollution because cage fish culture is not allowed under the reservoir management plan and inflows come from a relatively pristine NBCA. Thus, when water was diverted from the NT2 reservoir in January/February 2010, it was thought to probably not have any impacts on fish populations. However, during the other months of the year, the water quality of the hypolimnion does not allow fish productivity in the deeper parts of the reservoir. During these 10 to 11 months of the year, the water quality of the hypolimnion may have even impacts on fish populations at downstream locations of the reservoir (Mekong Secretariat 1984, Bernacsek 1997, ADB 2000, NTPC 2005 c chp:4 pp.21-24).

According to the water quality standards and water use classification of Thailand, water bodies used for fisheries and conservation of aquatic life should not have DO concentrations lower than about 5 mg/l, have ammonia concentrations lower than 0.5 mg/l, and should not have BOD concentrations higher than 1.5 mg/l (Pollution Control Department 1997). Any actual DO concentrations lower than 5 mg/l and any ammonia concentrations higher than 0.5 mg/l in the epilimnion of the NT2 reservoir or downstream in the Xe Bang Fai may lead to decreased productivity, fish diseases and a reduction of household fish catch. However, there is only a small risk that low reservoir water quality conditions of the hypolimnion in September will reach the powerhouse and thus cause detrimental impacts on fish populations in the Xe Bang Fai (CWR 1997, CWR 2000).

Impacts on Fisheries in the Xe Bang Fai

NT2's impacts on aquatic life result from changes in water discharges, water depth, and water quality. Changes in water discharges and the water depth not only have their direct impacts on aquatic life, but also this leads to impacts on the water quality, which subsequently will result in further impacts on aquatic life. In fact, the impacts of NT2 are significant in the Xe Bang Fai mainstream during the dry season mainly because this is when the fish reproduce. The introduction of rainy season conditions in Xe Bang Fai during the dry season is the main cause of a decline in fish reproduction. In contrast, during the rainy season when fish reproduction is low and NT2 is responsible for inducing relatively smaller changes in discharge and water depth, the impacts by are more negligible. There are more than 100 fish species in the Xe Bang Fai and limited human knowledge of the interaction of fish species, their migration patterns, and dependence for food on another high number of aquatic species make any impact assessment on fluctuating aquatic ecological communities only more complicated (NTPC 2005 c chp:4 p.36).

4.6.3.2 Social Impacts

The area surrounding the Xe Bang Fai is typical of many of Lao PDR's lowland areas as the people are dependent on rice paddy cultivation and fishing. The reliance on the Xe Bang Fai as a source of food and water is a central aspect for the livelihoods of these communities. Fish are an important part of their diet as they are a source of protein, vitamins and minerals.

The majority of fish are consumed locally, although it has been reported in surveys that about 23 % of families gain some cash income from fishing. In addition to rice cultivation and fishing, there are dry season riverside gardens which supply vegetables for local consumption, as well as crops for household consumption, animal feed and some sale (NTPC 2005 c chp:5 p.1).

- In 2001 there were 89 villages along the 175 km of the Xe Bang Fai that were considered as having potentially affected populations (both positively & negatively), consisting of approximately 7,100 households and about 41, 000 people. However the NGO Environmental Defence has estimated these populations to number up to 150,000 people.
- There are also those people living in 70 villages along the Xe Bang Fai mainstream in the section from the confluence of the downstream channel and the Xe Bang Fai down to the Mekong River.

Villages that experience a backwater affect include 12 villages located above the confluence of the downstream channel and the Xe Bang Fai as well as 7 villages on the lower Xe Noy (NTPC 2005 c chapter:2 pp.8-18, NTPC 2008 p.21).

Impact on Fishing Activities on the Xe Bang Fai

The fundamental impacts of the NT2 project on the fish catch of riparian and some hinterland villages are because of:

- The effects on the fish's ability to reproduce.
- The influence on the efficiency of fishing gear and techniques, related to (a) the physical ability to catch fish in deeper water with a higher velocity, and weekly fluctuations of water levels, and (b) problems in trapping fish travelling to and from wetlands.
- A third impact, which is more of an extension of a current problem are the effects on fishing efforts, in that fishermen have invested more time and money (on more fishing gear)⁵⁰ to try to catch the same amount of fish as they could before the project, as the fish yields may also have reduced since the start of the project.

According to NTPC (2005), the annual fish catch of riparian or mainstream villagers before the project was 3,000 Kg and that the predicted decline after the project's commencement amounted to 600Kg of the annual fish yield.. The affected villages are expected to have roughly a 21.5 % decline of the total fish catch because of NT2.

The annual fish yield of hinterland households by the Xe Bang Fai mainstream is estimated to be a maximum of 1,200 Kg/year. Out of the total of 7,500 households living in the hinterland villages only 1,700 households, or 23.2 %, are fishing in the Xe Bang Fai mainstream (NTPC 2005 c chp:5 p.11).

Impact on Aquatic Production Collection and Income

⁵⁰ (i) Higher and deeper water; (ii) faster flowing water in the dry season; (iii) fluctuation of water levels in the dry season; and (iv) less pronounced fluctuation between wetlands and main river, from the wet to dry season

Riparian households also forage for aquatic animals such as frogs, shrimps, crabs, snails, and mussels and collect aquatic vegetation, mainly for consumption. Household catches, collection and consumption of such aquatic life may reduce as a result of the impacts in the mainstream. However, in aquatic habitats such as tributaries, wetlands, floodplains, and ponds (*nong*) where aquatic life is not affected, villagers are still be able to collect these aquatic products. Detailed baseline data on aquatic products from the mainstream Xe Bang Fai have yet to be collected, and thus the following assumptions have been made:

- (i) An average annual loss in aquatic products valued at USD 20 per household per year for the 6,100 riparian households (population data from 2001) that live along the Xe Bang Fai mainstream between the confluence with the Nam Phit and the Mekong River.
- (ii) An average annual loss in aquatic products valued at USD 10 per household per year for the 1,700 households (population data from 2004) that live in the so-called hinterland villages, but collect aquatic products in the Xe Bang Fai mainstream (NTPC 2005 c).

Impact on Riverside Gardens

There are various types of crops and gardens grown on the sloping banks of the Xe Bang Fai, which are generally established in two locations in the following three main periods or seasons:

Locations:

- (i) Sloping mid and upper slopes of the river,
- (ii) Lower and often flat slopes.

Seasons:

- (i) Early dry season, when the river's discharge is decreasing, and the crops are grown using the groundwater that is still found in the upper and mid slopes.
- (ii) Mid to late dry season, when the river has achieved a relatively stable low flow and crops, mainly vegetables are grown with water drained from the river,
- (iii) Early wet season, when the river is still low but increasing in discharge and crops can be grown on the upper slopes using rainfall.

Thus, a maximum of about 199 ha of crop fields and about 1,550 ha of vegetable garden fields, farmed by up to 1,500 households may be impacted by the NT2 Project. They may not be able to re-establish fields and gardens high up on the river banks, at least for a few years after the project has begun due to erosion and the high water levels during the dry season as water is released from the dam (NTPC 2005 c).

Impact of Erosion on Riverside Assets

Various fixed assets or buildings are currently located on the banks of the Xe Bang Fai which consist mainly of houses. However there are also some shops, rice barns, open rest pavilions and temples. With increased erosion rates along the river (predicted to increase to 20 metres in the early sections of the upper Xe Bang Fai) there is a potential that the structures located close to the riverbank may start to slip into the river. For the owners of fixed assets on the edge of the riverbank in the mid and upper zones of the Xe Bang Fai, the impact of such erosion would either result in:

- (i) The construction of riverbank protection in sections of the riverbank in front of (and to protect) these structures.
- (ii) The requirement to relocate the structures further away from the edge of the riverbank (NTPC 2005 c).

Impact on Pumping Installation Management

The weekly (weekend) drop in the Xe Bang Fai river level, due to the cessation of NT2 Project discharges on Sundays, means that there is the requirement to make adjustments to the way that irrigation pumps floating on the Xe Bang Fai are connected by flexible hoses to the supply pipes carrying water up the irrigation canals on top of the river bank.

Since the commission of the NT2 Project the river rises and falls significantly once per week, and thus the way in which these hoses are connected and disconnected to the supply pipe footings has to be improved to make it more practical.

Impact on Domestic Water Use

The water in the areas downstream the power station might not be suitable for human consumption, or even domestic use, during the first years of operation, due to four main factors:

- i. Increased turbidity, especially during the dry season.
- ii. Presence of organic matters, originating from the decay of the biomass on the plateau.
- iii. Possible presence of sulphur compounds (H_2S), due to anoxic decomposition of biomass, which is most likely during the dry season.
- iv. Difficulty to access the water during the week-end drawdown (slippery and/or eroded riverbanks) (NTPC 2005 c).

4.6.4 The Nam Theun Basin

Once the Nakai Dam wall had been completed in April 2008, a diversion channel was built to take water around the dam wall. After the channel was dosed the Nakai reservoir was allowed to fill up. The flows of the Nam Theun (NT) have been measured, either directly or indirectly, since 1950. Records show an average flow of 7.5 billion Cm^3 of water each year. Based on the available statistics the water flows of the NT were greater than reservoir's total capacity in 49 out of the 50 years since records began. In other words this means that the water flows of the NT would have filled the reservoir's "active capacity" (i.e. the water volume that can be used for generating purposes) in just one year. There are no permanent resettlement or established villages and also no cultivated land until some 50 km further downstream from the Nakai Dam, but there are some households (around 415) from the 38 nearby villages which occasionally use it for fishing. Moreover, the tributaries of the Nam Theun (between the Nam Theun 2 dam and the Theun Hinboun dam) would be affected in some ways in terms of impacts on fisheries (World Bank 2010 c).

Environmental and socio-economic impacts are expected in this area. A greatly reduced water flow on the stretch of the river below the dam will have a significant effect on river

processes. These are the fundamentals of hydrology and hence will affect the river's natural habitats. Socio-economic impacts are likely for the villages that use the area for fishing.

The area also has value as a wildlife habitat, as it forms part of the Nakai Nam Theun - Phou Hin Poun corridor. The NT2 dam significantly reduces water flows in the area, changing fish habitats, some riparian vegetation, and potentially the use of the area by wildlife. Fisheries and the environment were already under pressure due to other factors, including the interruption of fish migration routes by the Theun Hinboun dam, pollution from mining activities and inappropriate fishing techniques such as dynamite fishing (NTPC 2005 c chp:2 p.3).

4.6.5 Other Project Lands

Additional project impacts were related to the construction of the powerhouse, the dam, and ancillary works, including the transmission lines, roads, quarries and work camps, with most of them located in populated areas or areas with degraded habitats. Baseline environmental conditions in these areas, such as air and water quality, were all very good. During the construction period, NT2 had adverse impacts on the water quality and resulted in erosion, dust, noise and the clearing of vegetation, as well as additional pressures on the area's biodiversity due to the presence of a large group of workers. The minimization of such impacts was addressed through the head contractor's Environmental Management and Monitoring Plan. Compensation for land acquisition, resettlement of about 90 households and impacts on the livelihoods in these areas were provided for through resettlement action plans and resettlement frameworks in the Social Development Plan.

5 IMPLEMENTATION OF UPSTREAM MITIGATION

5.1 Implementation of Resettlement

Both the GoL and NTPC took full responsibility for the resettlement, compensation and mitigation measures in respect of the affected people.

The NT2 resettlement committee issued a resettlement policy designed specifically for the NT2 project in 2002, because the draft decree on the Compensation and Resettlement of People Affected by Development Projects (No.192/PM) was issued in June 2004 and the implementation decree had been active since 2005 [for more details please refer to 2.6.2. Compensation and Resettlement in Development Projects]. NT2 policy prescribes the provision of agricultural and forestry land and development compensation packages. The objective is to provide means for the sustainable livelihoods of the affected population. This policy is related directly to article 6.2 of the CA [*please refer to 2.7..8. The Concession Agreement*].

The structure and the role of the resettlement and compensation committee as well as their responsibilities at each level will be reviewed briefly to ensure that the mitigation measures for the affected people in the upstream areas of the Nakai reservoir were implemented.

5.1.1 Government Structure for Compensation and Mitigation

On the government side, there are several organizations which have been established in order to work with the NTPC both for the planning and the implementation of the project, including [please refer to 2.7.6 Resettlement Committee Regulations):

- The Resettlement Committee (RC);
- The Resettlement Management Unit (RMU);
- The District Resettlement Working Group (DRWG).

These organizations or committees are staffed by current GOL staff members who are employed either part or full time for the NT2 project.

The mechanisms in place to ensure the close coordination and cooperation between the GoL and NTPC include:

- An NTPC employee became an official member of the RC, as co-Chairman.
- NTPC is the source of funding for the programme, and has acted as the procurement agent.
- All plans and budgets are developed, reviewed and approved by both NTPC's Resettlement Office (RO) and the RMU.
- The RC has the right to review and provide approval or no-objection to all plans.
- The NTPC's RO and the GoL's RMU share the same office in Nakai.

5.1.1.1 Role and Responsibilities of the Resettlement Committee

The RC is responsible to the Vice Prime Minister, who is the chairman of the national Nam Theun 2 Project Steering Committee with a representative of the NT2 Resettlement Committee being in the position of co-chairman.

Three provincial women leaders have been placed in the RC, while the Deputy RMU staff continues to be filled by members of the Khammouane Lao Women's Union.

The role of the RC is to ensure that all aspects of the SDP that are GoL's responsibility are implemented in a timely manner according to the specified budget. In addition to this role, the general responsibilities of this committee are to direct, guide and manage the resettlement process⁵¹.

5.1.1.2 Role and Responsibilities of Resettlement Management Unit

The RMU works under the leadership of the RC and also in close coordination with RO. The responsibilities include working with RO in planning and implementing the resettlement process and facilitating GoL authorities to participate in resettlement planning such as by conducting socio-economic surveys of the affected people. Furthermore they direct their attention to consulting affected villages, investigating potential resources and developing livelihood scenarios as well as identifying and assisting the most vulnerable families (NTPC 2005 d chp:8).

RMU staff generally consists of experienced national and provincial level managers and professionals who are able to coordinate and advise on a range of key activities. They are required to report on the plans and progress of activities to the RMU cabinet and when necessary directly to the RC. The overall personnel recruitment aims for a 50-50 gender balance. The RMU is composed of a cabinet and the following seven technical and administrative units:

- a. Infrastructure Development Unit
- b. Livelihood Development and Training Unit
- c. Social Services Development Unit
- d. Consultation and Disclosure Unit
- e. Land Asset Registration and Titling Unit - This unit works with the NTPC project lands team, or their contractors (who take the lead in surveys and registration) and is responsible for GoL's input and responsibilities in this programme, including land registration and land titling.
- f. Monitoring and Evaluation Unit.
- g. Administration and Finance Unit

5.1.1.3 4.1.1.3. Role and Responsibilities of District Resettlement Working Group

The District Resettlement Working Groups have been established in the districts of Nakai, Khamkeut and Gnommalath. In the other districts of Mahaxay, Xe Bang Fai, Nongbok and Xayboully the DRWGs are known as 'compensation' working groups, as the villagers were confused by the word 'resettlement'.

Under the direction of the RMU the District Resettlement Working Groups (DRWG) are directly responsible, , for implementing all relocation and rehabilitation work in their district.

Furthermore in cooperation with the villagers, and under the technical direction of the RMU and RO the DRWGs are responsible for the implementation of, relocation, rehabilitation, compensation and development activities in their particular district by using the gender, ethnic, and poverty sensitive approaches (for more details please refer to the Social Development Plan Volume 4, chapter 8).

⁵¹Details of the RC's responsibilities are outlined in the SDP, Volume 4, Chapter 8

Staff members of the DRWG come from the local district administration office that are seconded to work, generally full time, on the NT2 project activities. However, during peak staffing needs the GoL recruits a number of extra people who in most cases are recent university graduates. The type and number of staff depends on the nature and scale of resettlement tasks that need to be conducted in that particular district.

5.1.1.4 Village Resettlement and Development Committee

The Village Resettlement and Development Committee ensures that the villagers can fully participate in decision making and develop ownership of activities related to the NT2 project. Moreover, this organization will represent the interest of villages on the Nakai plateau and conduct public consultations with their village in relation to the resettlement process. It also creates Village Development Plans (VDPs) for their village and monitors and evaluates the resettlement process (for more details please refer to the Social Development Plan Volume 4, Chapter 8).

5.1.2 NTPC's Resettlement Office

NTPC is responsible for jointly developing a SDP with the resettlement organization of GoL. The company established a Resettlement Office (RO) which is specifically responsible for all of NTPC's social and resettlement activities whilst working in close cooperation with the GoL, RC and RMU.

5.1.2.1 Role and Responsibilities of the NTPC's Resettlement Office

The RO concerns itself with all aspects of resettlement, namely livelihoods, social and community development, including project land resettlement and compensation.

Close and daily liaison and cooperation with the RO and the RMU have been, and continue to be a feature of the social and resettlement activities in the NT2 project, as both the GoL and the project developers have a clear goal to ensure that all social and resettlement issues are dealt with both professionally and fairly, as well as in a timely and sustainable manner (for more details please refer to the Social Development Plan Volume 4, Chapter 8).

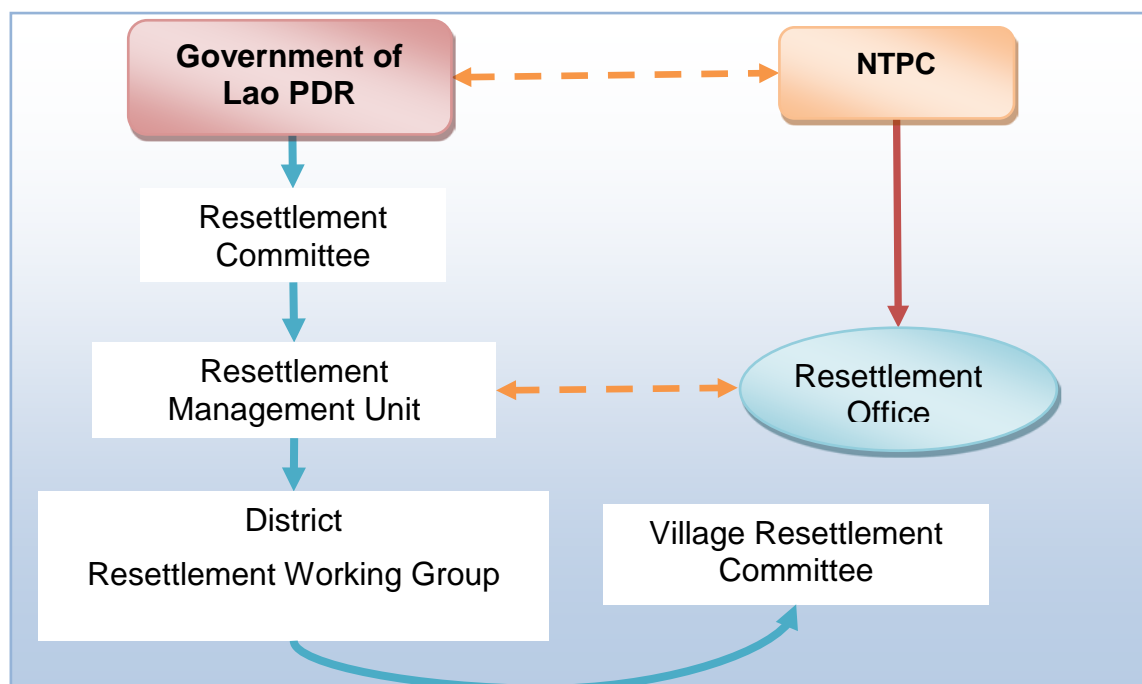


Figure 4: Institutional Arrangements for Resettlement

Source: author from NTPC

5.2 Organisations Related to Resettlement and Compensation

5.2.1 Grievance Committee

This organisation has been created to ensure that the basic right and interests of resettled community are protected, concerns are adequately addressed and entitlements delivered (for more details please refer to the Social Development Plan Volume 4, chapter 8).

5.2.2 Provincial Authorities

Khammouane, Savannakhet and Bolikhamxay provinces are represented on the resettlement committee and in the Resettlement Management Unit. The provincial authorities have a very important role because many activities in the implementation of resettlement require the approval and support from the provincial government including for example land allocation for resettlement. Furthermore there are all the changes in the provision of government services such as new clinics and schools which also require the approval of the provincial authorities (for more details please refer to the Social Development Plan Volume 4, Chapter 8).

5.2.3 Lao Women's Union

The Lao Women's Union plays an important role in implementing the project's resettlement process. They help to organize designated activities, especially ones that involve the

community, and also coordinate training on different subjects such public health, family planning and education for women.

5.2.4 Consultants and Contractors

Many activities related to the relocation, infrastructure and livelihoods of the affected people can be carried out by both local and international private contractors. These private contractors have technical capacity, extensive knowledge of local socio-economic conditions as well as experienced local staff, which allows them to effectively carry out some designated components of the resettlement program.

5.2.5 NGO Involvement

The NGOs have skills that may enhance government organisations in carrying out specific tasks as outlined in the RAP such as implementing agricultural activities, and organising community based activities such as health programmes and adult education.

5.3 Resettlement Process

The construction schedule specified that the Nakai dam would remain closed for 37 months once building had begun⁵² (starting from April 1, 2005). The plan was therefore for the Nakai dam to be closed until on or about May 1 2008, which was the start of the 2008 wet season (NTPC 2005 b chp: 18 p.1). Test hydropower generation finally began in mid 2009 and in March 2010 the project's four export production turbines started full commercial operations (NTPC web site 2013). Resettlement of all the villages on the Nakai plateau had been completed by the end of June 2008 (World Bank 2010).

NT2's commitment to more than 6,300 people who have been resettled goes beyond compensation through relocation as the aim is to help them develop better livelihoods and living standards than they had before the project.

The review of other projects suggests that rebuilding sustainable livelihoods for those resettled by large dams is particularly challenging. The broad reasons are easy to understand as dams often require the resettlement of entire communities (rather than, for example, the resettlement of specific households to make way for a road) which can be immensely disruptive to the social and cultural fabric of communities. Dams are often developed in remote and mountainous areas and therefore impact poor or vulnerable people. Furthermore they may also significantly impact the previously existing livelihood opportunities, by, for example, flooding agricultural areas that communities have historically relied on.

Therefore, as the majority of Lao households depend traditionally on agricultural land, rivers, and forests for their income and food it makes them vulnerable to sliding or sliding more deeply into poverty and by negatively affecting their nutritional intake. Poor households depend on home grown rice production for 94 % of their total consumption needs, and even those in urban centres such households depend on rice for 50 percent of their nutritional

⁵²Volume 2 – Chapter 18: Scheduling of Plateau Resettlement Programme

needs. The reliance on wild protein is also very high; up to 80 % of fish and more than 20 % of meat consumed comes from the wild. Since stunting and malnourishment are highest (more than 50 %) among children from those households that are most reliant on wild foods and subsistence rice production, the disappearance of land and forests along with these non-cash traditional and significant sources of food as a result of the large-scale development of hydropower stations and mineral extraction could lead to serious negative consequences for these families (Fenton, Lindelow et al. 2010 a, Fenton, Lindelow et al. 2010 b)

NT2's resettlement programme was fully aware of these challenges during the project planning phase, and there are a number of unique steps that the NT2 took in order to address these challenges, including:

- Establishing socio-economic targets within the CA. The targets are considerably above baseline levels, legally binding, measurable, and are intended to be reached 5 years after the main impact on the resettled individuals' livelihoods has occurred.
- Providing a package of financial, technical and social assets, opportunities and support to resettled villagers to build new livelihoods [*Appendix 2*]⁵³.
- Providing a safety net to those who need it during the transitional period in order to help people adapt to their new circumstances, and take risks such as changing agricultural practices, which are necessary to build a new life.
- Investing in significant and regular socio-economic monitoring to enable adaptive management during the programme's implementation and the measurement of the targets after five years.
- Establishing external and independent monitoring and oversight groups that ensure the overall integrity of the process, as well as provide expert advice to the project [*Appendix 3*] (World Bank 2010 b).

As with other resettlement processes around the world, the NT2 resettlement process has unfolded in three broad (and slightly overlapping) phases:

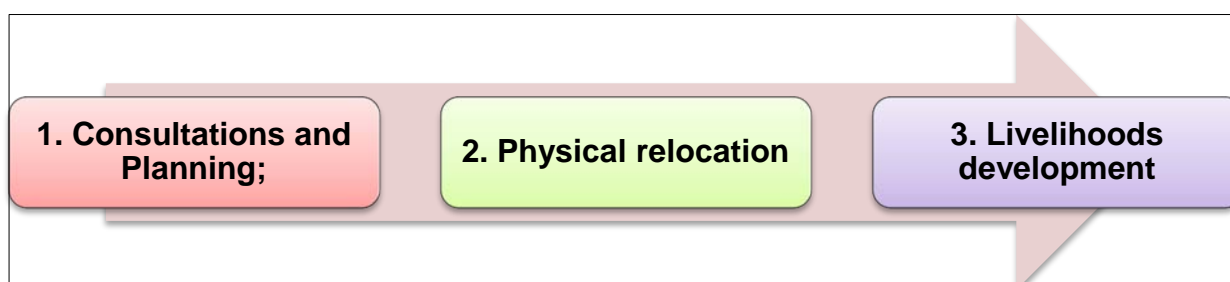


Figure 5: NT 2 Resettlement Processes

According to Scudder Thayer's (2005) theory of the resettlement process there is a four-stage framework to deal exclusively with successful involuntary resettlement in connection with dam construction. In terms of success he simply defined it as being development that is

⁵³ The resettlement package is outlined in detail in Schedule 4 of the Concession Agreement, which was publicly disclosed at the time of project approval.

environmentally, economically, institutionally and culturally sustainable into the second generation. His four-stage framework takes into account:

- 1) Who is to be resettled and with the planning for their removal, rehabilitation and development “**planning and recruitment stage**”.
- 2) The physical process of resettlement and the years immediately following removal. During the second stage, the behaviour of the majority tends to be risk adverse and their living standards can be expected to drop “**adjustment and coping stage**”;
- 3) The process of community and economic development, during which risk-taking occurs and the majority of the resettled people are able to improve their living standards “**community formation and economic development**”.
- 4) That development continues or is maintained in stage four when the handover⁵⁴ and incorporation⁵⁵ occurs “**handover and incorporation stage**”(Scudder 2005 pp 32-40).

5.3.1 Resettlement Stage 1: Consultation and Planning

The consultation process was started as early as in 1996. Firstly the project conducted a baseline survey so that there was a comprehensive understanding of the pre-relocation livelihood base of the affected people [see **Photo 7**]. This survey provided insights as to the possible impacts from the inundation of the Nakai plateau (please refer to Social Development Plan, Volume 2, Chapter 2), and indicators that could be measured during the different stages of the resettlement process. These baseline survey indicators included household size, livelihood options, asset ownership, food sources and seasonal food security, as well as the different skills, needs and resources of different households. A detailed analysis of the different livelihood patterns, needs and characteristics of Nakai’s diverse ethnic groups was also carried out. Moreover detailed consultations, community outreach and planning then followed so as to determine where people would be resettled, the possible design of new houses [see Figure 6] the village layout, and to identify livelihood opportunities and support.

⁵⁴Two types of handover occur: Firstly the resettlement project authority or authorities handover institutional responsibility and assets to resettled communities, line government ministries and other agencies. The other is the first generation of resettled families handing over to the second generation.

⁵⁵Incorporation involves the integration of the resettlement area or areas into the surrounding political economy. In this case ongoing success means that the second generation is able to compete for their share of national resources. Therefore the entire process spans over two generations.

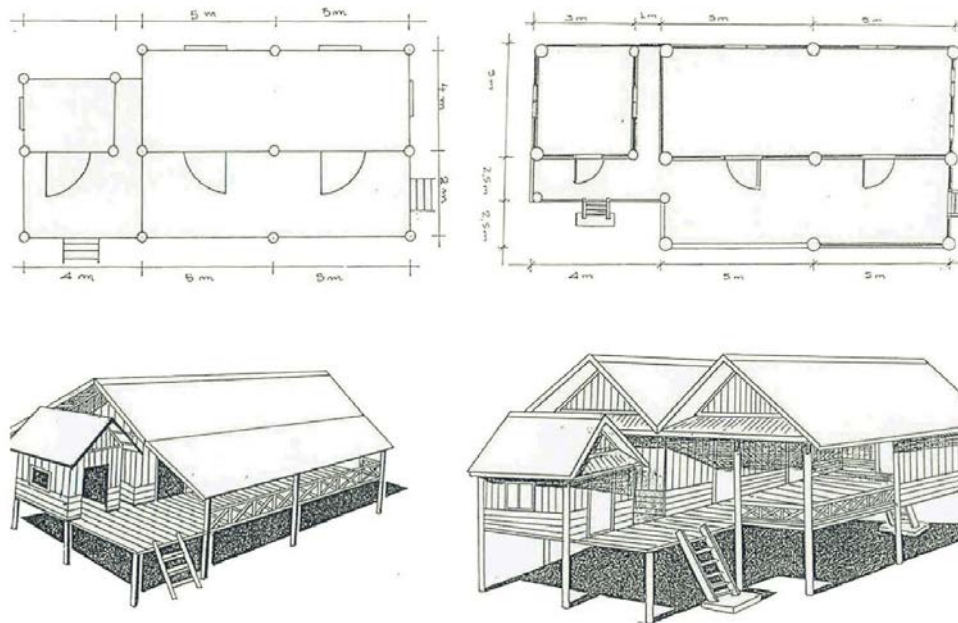
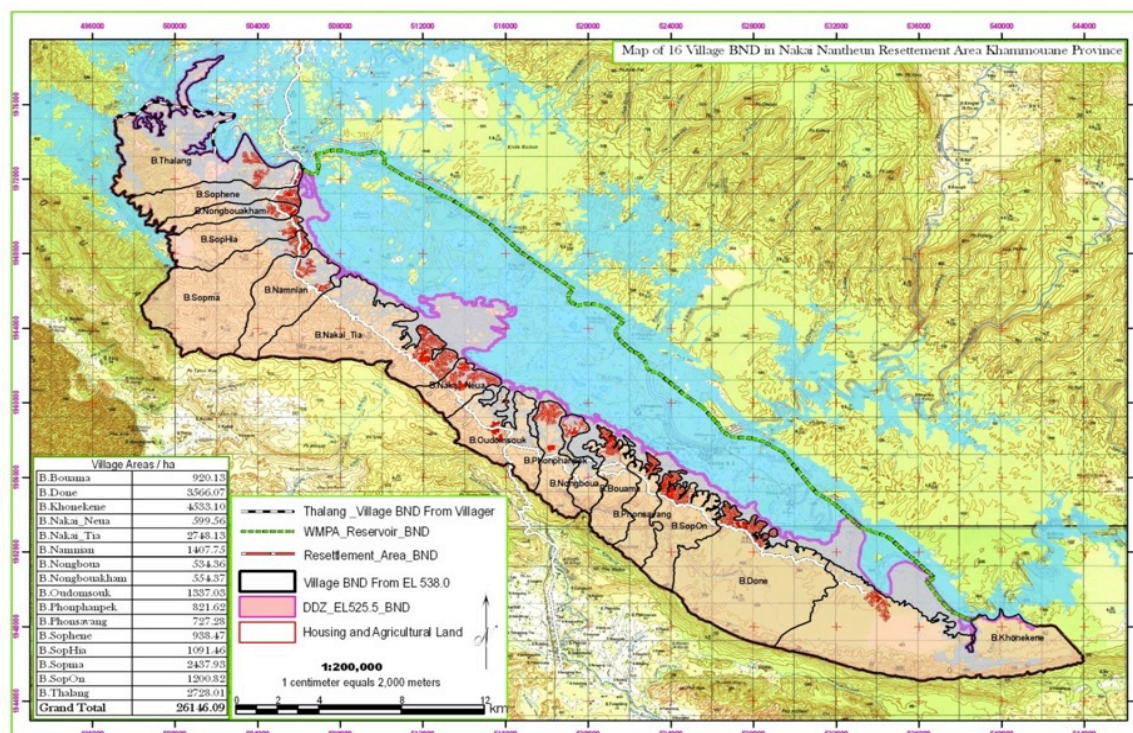


Figure 6: House Designs Following Consultations in 1998 (NTPC 2005 b chp:11 p.4)



Photo 7: Pre-relocation Community Consultations. Photo: NTPC, 2005

The resettlement sites were chosen by project managers and villagers [see Map 5] through a joint consultative process which took a wide variety of factors into consideration, including social concerns such as a village's spiritual areas and customary boundaries. Furthermore there were agricultural considerations including access to water, land availability and soil quality, as well as access to roads, reservoir waters, forest and grazing areas. Resettled villagers were offered the option of moving to a location off the plateau where good agricultural land was available. However they rejected this offer, preferring to remain close to the land where they have strong spiritual ties, despite the ensuing livelihood challenges that such a decision would present.



Map 5: Resettlement Areas Determined in Consultation with Affected Villagers

Source: NTPC

The resettlement package which was provided to all resettled villagers included housing, a water supply, electricity, agricultural land and community infrastructure [refer to *Appendix 2*], as well as food support and other assistance to help ensure that living standards did not fall during the transitional period – a common risk in resettlement projects. A topographic survey and mapping of each resettlement site preceded the provision of infrastructure⁵⁶. The resulting maps were used as a basic tool for the on-going consultations with the villagers, who participated in the planning and design of the village, their houses, the community buildings and other facilities.

This SDP also took into account the views of the different affected communities, GoL and international organisations such as the International Environmental and Social Panel of Experts, World Bank, Asian Development Bank, and the International Financial Institutes that provided financial support for the development of the project⁵⁷.

5.3.2 Resettlement Stage 2: Physical Relocation

The affected villages moved from the area that became the NT2 reservoir on the Naka plateau to custom built villages situated along the edge of the reservoir. In 2006 the physical

⁵⁶ Each resettled village was provided with the following community buildings: nursery and primary school; meeting hall/community centre/village office; market, small or larger, depending on village size; rice mill and workshop; as well as organic fertilizer factory.

⁵⁷ Social Development Plan NTPC:

http://www.namtheun2.com/index.php?option=com_content&view=article&id=91&Itemid=102

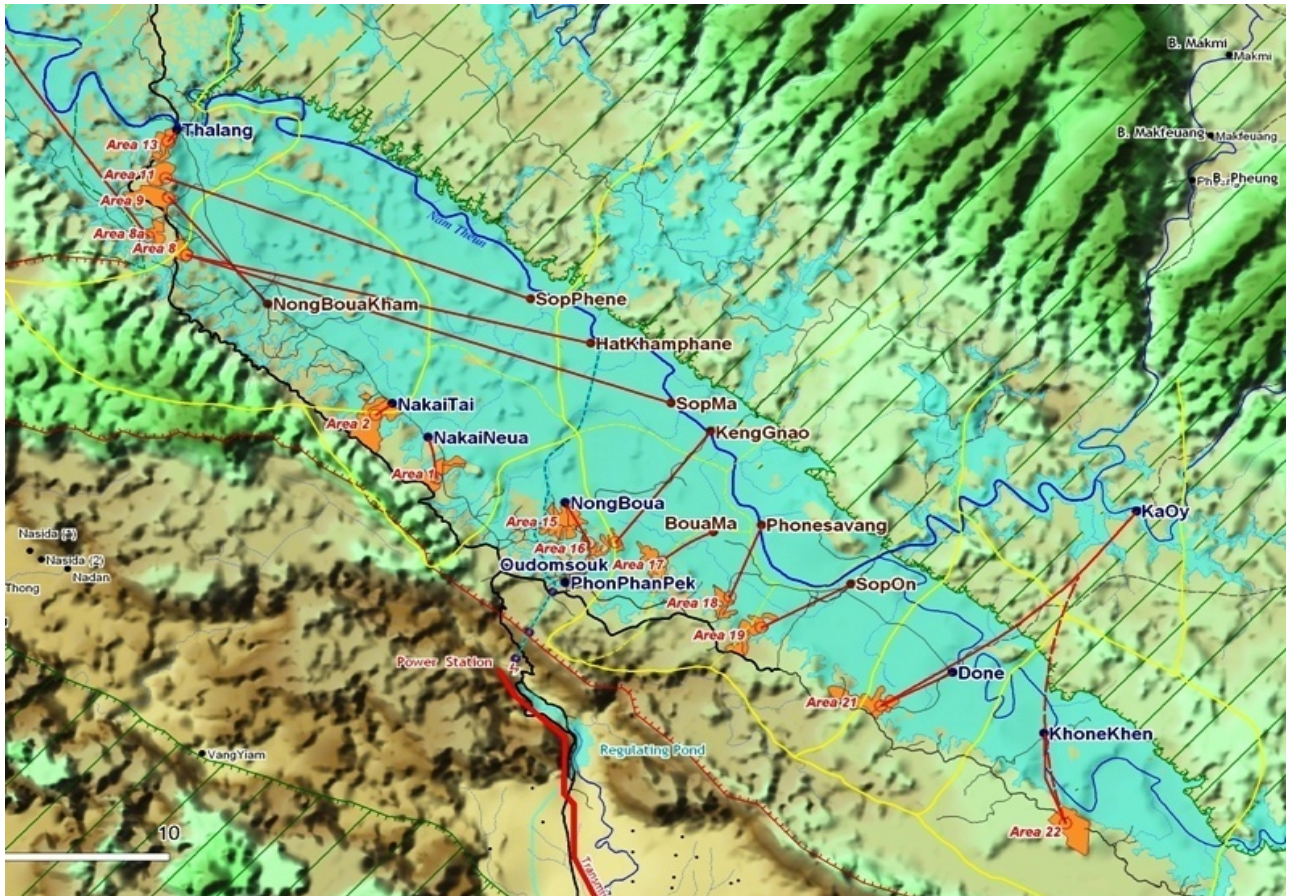
relocation started with the first group of villages that were on the Nam Theun upstream of the dam site. These villagers were firstly relocated to temporary housing as the civil works and initial construction of the dam site on the river bed rock required their immediate relocation for safety reasons. Following on the second group of villages were moved directly into their new houses in the relocated villages [see Map 6] and by the end of June 2008, the relocation of all the villages had been completed.

The affected communities were directly involved in the construction of the new villages and the clearing of agricultural land. This not only helped to engage the community in the process, but also provided them with paid employment at a time when they could not practice some of their traditional livelihood activities. Socio-economic surveys reveal that the resettled villagers experienced a major boost in their income during this period from project-related wages. Due to the fact that the livelihoods of many were disrupted during the transitional period, as they were busy preparing new land and constructing housing, households received rice support in addition to these wages, amounting to a monthly ration of around 18kg of rice per adult and 12 kg per child⁵⁸. Nowadays, all of the families are settled in new homes supplied with electricity and there is a supporting community infrastructure in place. The construction of appropriately equipped schools and a health centre, housing for teachers and health care workers, community buildings, village access roads and water wells has also been completed. In all, the entire project has provided the following infrastructure [see Photo 8]:

- ✓ 1,374 permanent houses for resettled households;
- ✓ 32 nursery and primary schools;
- ✓ 2 public dispensaries or health centres and a renovated district hospital;
- ✓ 1 borehole for every 5 households and
- ✓ 1 rice mill for every 5 households and a rice storage facility for each household.
- ✓ More than 100 km of connecting road between the resettlement areas
- ✓ Village office, a village storage house and a market for each of the resettled villages
- ✓ Electricity installed in each household
- ✓ Irrigation for each 0.66 ha parcel of land allocated
- ✓ Tree nursery for each resettled village and zone

A Social and Environmental Remediation Fund (SERF) provides \$300,000 per year during the operational period to cover the service and maintenance costs of the communities' water and irrigation systems, as well as other resettlement and livelihood activities. However, sustainability will only be achieved with the involvement of the communities themselves, which remains an ongoing process (World Bank 2010 b p 15).

⁵⁸The Lao government sets the poverty line, as defined in **Prime Minister's Decree No. 285**, to be equivalent to the cost of 16kg rice/person/month. This means that the rice support alone could be considered to be sufficient to bring every household above the poverty line during the transitional period. However this is as long as the households were able to supplement the rice with animal protein, fruit and vegetables in order to ensure an adequate nutritional intake.



Map 6: Old Villages Relocated to Resettled Village Areas

Source: World Bank, 2010 in "Nam Theun 2 resettlement: taking stock at the halfway point"





Photo 8: Infrastructure of the Resettled Village Provided by the Project

Source: photo by Porter, Shivakumar, 2010 (Plate 2&3) and NTPC Resettlement committee

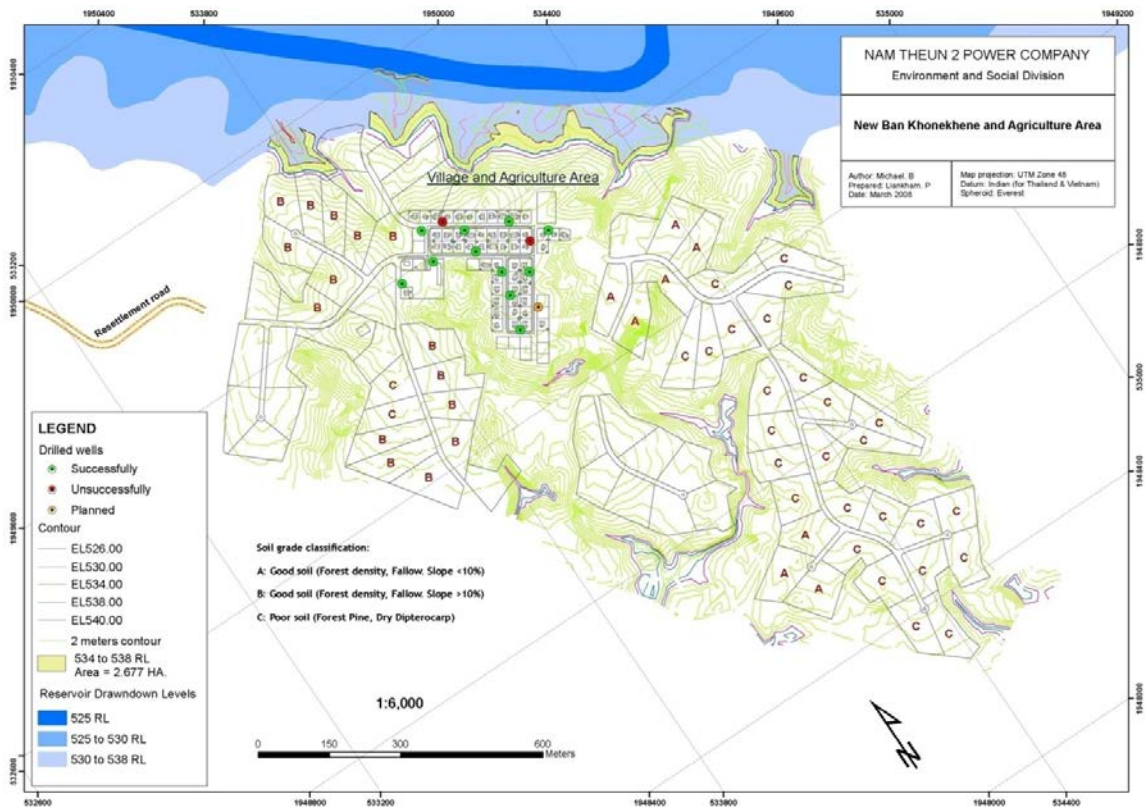


Figure 7: New Ban Khonkheh's Village Layout and Agricultural Areas

5.3.3 Resettlement Stage 3: Livelihood Development

The livelihoods development programme began during the planning and consultation phase, when a variety of demonstration activities were developed, partly to better understand the agricultural potential of the resettlement area, and partly to start to engage communities in more practical discussion about their new lives and livelihoods. By the time the physical relocation had been completed, there were numerous activities underway based on agriculture, livestock, fisheries, forestry and off-farm opportunities. The post-relocation livelihood programme took into consideration the natural resources available to the resettled villagers, their skills, traditions and previous livelihood patterns.

It is important to recognize that livelihood development in a resettlement situation is not simply a technical process, but also one that involves profound social change. The livelihood programme had therefore been designed to help people understand their new opportunities, encourage learning within communities, and also to support people as they endeavour to succeed in their new lives.

The project has put in place socio-economic monitoring systems to track progress towards meeting the stated commitments across a wide range of areas, including health, education, environmental protection and household income. The household income targets were measured in 2013 but the results were not available at the date of publication, and it is therefore, too early to judge whether the goals and objectives have been achieved in full and that livelihoods are entirely sustainable.

5.4 Compensation in the Nakai Reservoir Area

NT2 has to fully compensate, lost assets, livelihoods and incomes based on their Social and Resettlement Programme. There are two common types of compensation and the general principles and the process involved in these compensation types has already been noted (please refer to 2.7.9. *General Principles of Compensation and Livelihood Restoration*). Actually, the resettlement on the Nakai plateau was completed in April 2008 and villagers were supposed to have been compensated for lost paddy fields and gardens before being resettled.

According to Mekong Watch⁵⁹ (2010), "*compensation processes did not start until around October 2010. Asset measurement to determine the amount of compensation affected families were entitled to was conducted in 1998, but it was inaccurate because there was no uniform standard to evaluate villagers' assets. Relocated families have now been complaining about decisions that were made on what they were to be compensated for and how the compensation was calculated. They may lodge an objection against results of asset measurement and request reinvestigation, but it will be extremely difficult to verify the accuracy of measurement, as their assets have been under the water for two years since the reservoir was filled*" (Mekong Watch 2010).

Mekong Watch deliberates further that, "cash compensation and irrigation installation in the resettlement areas should have been completed before the dam's commercial operations."

⁵⁹ A Japanese NGO which has been monitoring environmental and social impacts of the Nam Theun 2 dam in Lao PDR, visited the affected areas in November 2010.

“The World Bank and the Asian Development Bank are backing up the GoL in trying to promote “poverty reduction through dams” while using NT2 as a model. However, if such a model is replicated without solving, among others, the problem of long-term livelihood restoration facing the project, “poverty reduction” promised by the model will only continue to create new poverty”(Mekong Watch 2010).

Then, according to the World Bank’s (2012) "Nam Theun 2 board update: project progress during 2011"⁶⁰, all resettlement households have received compensation that goes beyond what they lost due to the project. In addition to the standard compensation package for all resettled villagers, the CA provided additional compensation for those who had lost fruit trees and paddy fields. Compensation for these items was completed in early November 2010, except for outstanding cases where there is a dispute over the amount or when there has been a change of domestic circumstances, such as death, divorce or people moving out of the area. A process is underway to resolve these cases. One of these cases involved 555 buffaloes which were said to have died due to project-related impact, which was finally settled between Nakai district authorities, NTPC and the Resettlement Committee. NTPC transferred funds to the Resettlement Management Unit and district authorities visited eligible households to discuss individual payments (World Bank 2012 a p.14).

In fact, the NT2 compensation processes were extremely lengthy as all compensation for the entitled affected families was completed ten years after the initial amount of compensation was calculated through the baseline survey.

5.5 Building New Livelihoods for the Resettled Nakai Communities

The post relocation livelihood programme is based on four different pillars [Figure 8]. During the planning stage the expectation was that each of these pillars could make a substantial contribution to the livelihoods of the resettled communities. As well as allowing households to achieve an acceptable level of income, having a diverse set of livelihood opportunities helps households to insure themselves against seasonal variations in income from crops, volatility in reservoir fisheries, and other forms of external and internal setbacks.

However, it is important to recognize that the households themselves decide which combination of livelihood opportunities to pursue –this will likely depend on their interests, skills, experience, and the availability of labour within their household to pursue over the long term (World Bank 2010 p.17).

⁶⁰ The publication is available on [http://documents.worldbank.org/curated/en/2012/01/16187828/second-nam-theun-board-update-project-progress-during-2011]

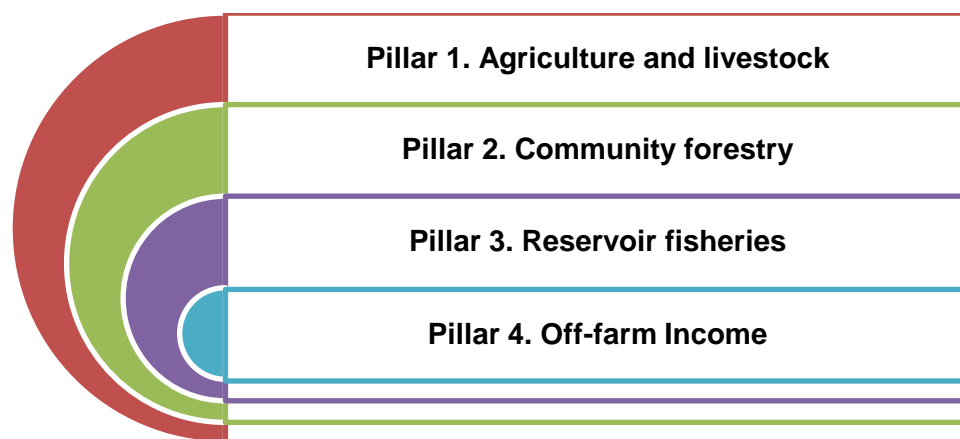


Figure 8: Pillars of the Livelihood Programme

The resettlement livelihood restoration plan has been developed under the Social Development Plan. It has helped the resettled villagers to attain previous levels or become even better-off through livelihood strategies in the new environment.

5.5.1 Pillar 1: Agriculture and Livestock

Rice plays a central role in Lao culture as it does account for 65 % of the country's total cultivated area⁶¹ (MAF 2012). Most of the households on the Nakai plateau cultivated upland rice before being resettled. Production was based on rotation, which happened roughly every seven years. Only a few of the better-off households, mainly in Nakai Tai, Nakai Neua, and Done were able to grow paddy rice. Average yields were around 0.8 tons/ha for upland and 1.5 to 2.0 tons/ha for paddy rice and the size of family land-holdings varied from 0.4 ha to 2.4 ha. Generally, large holdings are less intensively cultivated, due largely to a lack of available labour and/or draft power (buffalo and/or power tillers) (NTPC 2005 b chp:2 p.15). The filling of the reservoir not only required physical resettlement, but also flooding of large areas of land used by households and communities. While all households were provided with agricultural land as part of their compensation package, the land that is available amounts to considerably less than many used before as part of their rotating agricultural system. Indeed, a resettled family had only received 0.66 ha plot/family with road and irrigation access⁶². It was noted that not all of these plots finally ended up being irrigated.

The chart below shows the percentage of the resettled households that cultivated rice in the 0.66 ha plot. The plots were put to different uses [refer to Photo 9], and it has been observed that the households who became better-off with off-farm activities were less likely to use their plots in the first place. Some villages have been interested in generating an income from the cut and sale of rosewood as well as fisheries. Furthermore 60 percent of resettled

⁶¹Total cultivated area is 1,6 million ha

⁶²This size is fixed for every family and the size or number of family members was not taken into consideration. They now have the land title of their 0.66 ha plot and Participatory Land Use Planning has been established and is at the development stage in every village. The aim of this process is to demarcate boundaries and to identify potential land for households including land for the second generation of the resettled families. This aims to secure the resettled villagers' land use rights for their future farm development.

households have cleared their plots to grow cash crops; and also a high proportion decided to plant rain-fed rice (Mcdowell, Scudder et al. 2011 pp.12-13).

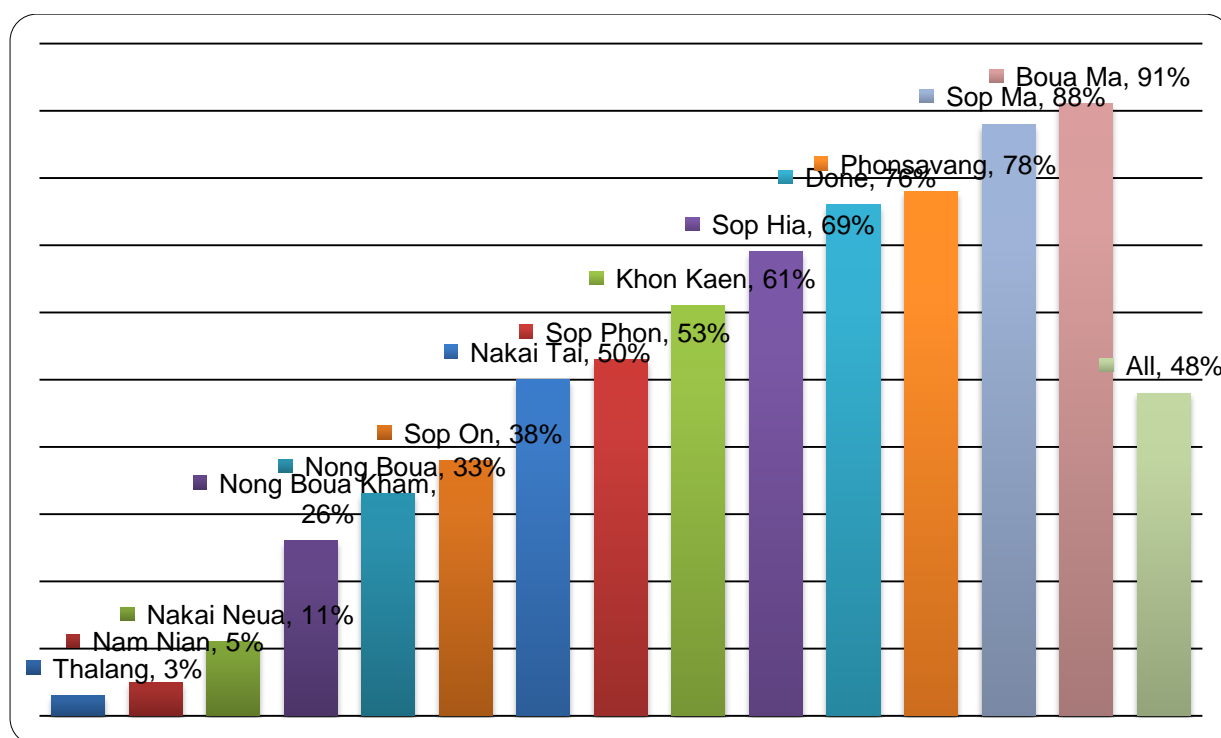


Figure 9: Percentage of 0.66 ha Plots under Rice Cultivation, 2010

Source: NTPC, June 2010

Additionally NTPC's resettlement office (RO) was responsible for supervising the nurseries, in which 10 of the farmers managed to produce over 40,000 different seedlings. Approximately 10 percent of resettled households had planted seedlings on their 0.66 ha plots by May 6, 2013 (Mcdowell, Scudder et al. 2013).



*Photo 9: Resettled Farmers' Agricultural Production on the 0.66 ha
Allocated plot*

Source: NTPC Resettlement committee

Despite the relatively poor soil quality of the Nakai plateau, demonstration plots have generated yields of over 3 tons/ha. The agricultural system that has proven most suitable for the conditions on the plateau is based on the rotation of crops with a type of legume called "styro". Additionally the system uses fertilizers, manure and improved crop varieties. Very high yields are unlikely for the majority of farmers, as they have to contend with significant social adjustments and new farming conditions, and therefore the average annual yield to date has been around 1.2 tones. However, it should be noted that all villages have already achieved upland rice yields above the 1998 average [see Figure 10].

Some villages in the south of the plateau have reported particularly successful harvests. For example, the farmers of Khon Kaen village who work with some of the least fertile soil in the area achieved an average rice yield of 2.4 tons/ha in 2008. This actually happens to be significantly higher than their pre-resettlement average. Overall yields did decline slightly in 2009, but on average remained close to the level that resettled farmers had previously achieved in paddy fields (World Bank 2010 p.19).

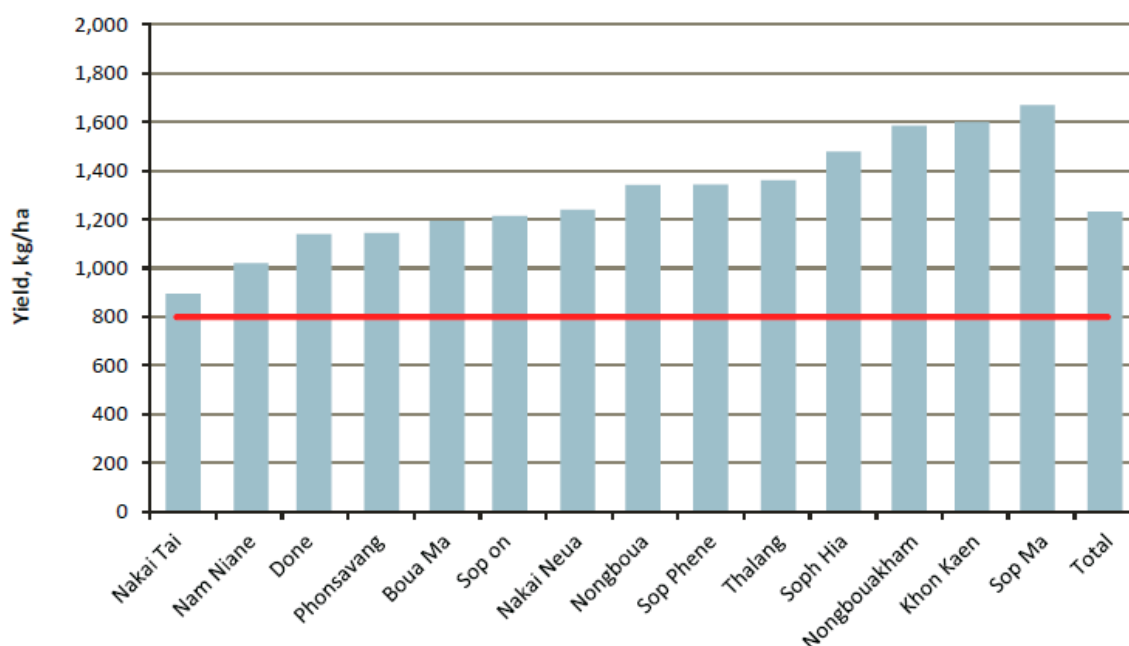


Figure 10: Average Upland Rice Production Yield, Wet Season Harvest, 2009

Source: NTFPC, 2009

Recent data (June 2010) indicates that many of the resettled farmers also grow vegetables and other crops in the gardens surrounding their houses. Furthermore villagers are starting to use land that has become available in the “draw down zone” – the area exposed every year as water levels in the reservoir fall during the dry season – to cultivate rice, maize, vegetables, cassava and corn and to use it for livestock grazing. While the draw-down zone has considerable potential, there has not yet been a full draw-down of the reservoir and therefore outreach and land use planning will be needed to help villagers understand exactly which areas they can use, and for how much of the year they are likely to be exposed (World Bank 2010).

Another challenge lies in the sustainable management of livestock. Normally, Lao households keep buffalo and cattle as a store of wealth and insurance, as well as a source of cash income.

Around 31 % of resettled households owned cattle or buffalo in early 2010, with an average of more than 4 animals per household which was similar to the figures in 1998⁶³. The fact that resettled villagers are able to invest in livestock should be seen as an indication of progress with their livelihood strategies.

In addition the project is trying to encourage households to keep smaller livestock such as pigs, chicken and ducks, which are more suitable for the conditions as they require less rearing space and easily marketable in small numbers.. Suitable breeds of smaller livestock have already been distributed to interested resettled villagers, and some of the households have been keen to take advantage of this opportunity. More than 50% of resettled households now own poultry, and 15% own pigs [see Figure 11]. If agricultural livelihoods are to flourish further it will be essential for the communities to maintain control over the

⁶³In 1998 around 40% of households owned buffalo, and the average was 3.6 buffalo per household (see SDP, volume 2, chapter 2)

number of cattle and buffaloes. They will need to find locations where the animals can safely graze and promote the development of cattle yards and the growing of grass at the family level. The transition from rearing buffaloes to cattle and smaller livestock should be encouraged, and a balance needs to be maintained between the requirements of smallholders and the environmental damage done by large commercial herds.

An International Environmental and Social Panel Of Experts (POE) has noted before, that the resettled villagers' buffaloes in the NBCA remain a threat to the native wildlife and vegetation, the artificial salt licks constructed for the elephants as well as the artificial wetlands. Perhaps more importantly, it gives the villagers an excuse to enter the NBCA to poach wildlife and to collect rosewood illegally. Recently 145 buffaloes were rounded up and returned to the resettled village areas with the assistance from NTPC, but a large number do remain in the NBCA (Mcdowell, Scudder et al. 2011 p.10).

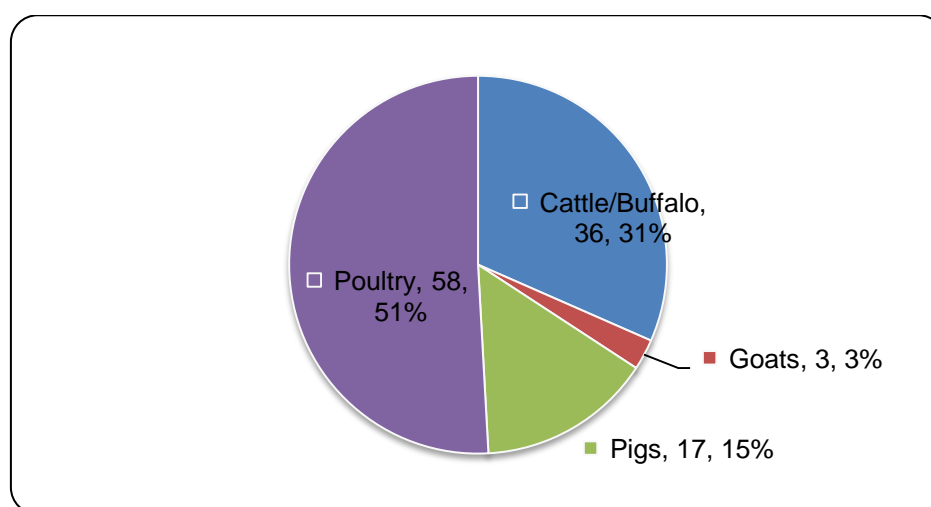


Figure 11: Percentage of Resettled Households Owning Livestock

Source: District Agriculture and Forestry Office (DAFO)

Unfortunately the baseline survey did not provide data to show the percentage of households who previously owned livestock so as to make a comparison with current ownership. It is known that only 40 % of households owned buffaloes in 1998, and that the average was 3.6 buffaloes per household⁶⁴ and so buffaloes are the dominant type of large livestock that are raised on the plateau. (NTPC 2005 b chp:2 pp.18-20). Figures from late 2010 show that there was a significant increase in the number of cattle on the plateau, driven by the success of raising 66 new calves and the purchase of cattle from outside the plateau⁶⁵ (World Bank 2010).

Research and tests were conducted in growing forage and other crops in the draw down zone. However, the level of water in the draw down zone is naturally different in each village

⁶⁴However, these averages mask the reality that the ownership is actually very skewed, with relatively few households (358, or 30 %) raising 3 or more buffaloes, with only 11 % of the households owning over 10 and 59 % of the households not having any buffaloes.

⁶⁵District Agriculture and Forestry Office report, September 27, 2010. These figures include livestock owned by non-resettled households in Oudomsouk and Phon Phan Paek, because it is the total number of livestock that will determine the sustainability of the herd size.

and therefore tests of crop and animal production techniques adapted to each village's conditions need to be continued since one technical package for the entire area does not appear to be useful. However, the project did promote and provide technical assistance for livestock and aquaculture activities for the resettled households [see Photo 10].



Photo 10: Promotion of Livestock and Aquaculture

Source: NTPC Resettlement Committee

5.5.2 Pillar 2: Community Forestry

Before resettlement, forest resources, and particularly Non Timber Forest Products (NTFPs), played a central role in the livelihoods of households. They were an important seasonal source of cash income in some villages and overall a significant source of food, particularly in times of low agricultural yield, when most households had deficient rice levels. In poor families NTFPs were often the only source of monetary income. In 1997, villagers could identify 306 species of NTFPs which included 223 food and 67 non-food products. *Kisi* resin, fish, frogs, edible rattan shoots, cardamom and wildlife were considered the most important⁶⁶

⁶⁶See "The use of non-timber-forest-products on the Nakai Plateau, report on a short mission from 26/2 to 30/3 1997", prepared for NTEC, Thakek, Khammouane province, by Joost Foppes, Thongphone Sayphaseuth, Khamsany Sengkeo and Seng Chantilat, available at [<http://lad.nafri.org.la/fulltext/LAD010320040174.pdf>]

products from the forest with 14% of villagers choosing damar resin, and 12% each naming rattan shoots and cardamom. *Damar* resin was one of the most valuable products and it almost tripled in value, which led to a huge increase in harvesting from 17 tons in 1996 to 80 tons in 1997⁶⁷. The situation with rattan has been less clear and cardamom harvesting remains generally stable (NTPC 2005 b chp:2 pp.20-21).

Post-resettlement the resettled villagers are still collecting a wide range of NTFPs for food and sale, with many people describing their abundance as “reasonable.”⁶⁸ The availability and ease of access to fish, which were previously gathered in small ponds and streams and are therefore considered to be a NTFP, has increased dramatically. However, a significant number of households complain about reductions in access to NTFPs and the longer distances that they need to travel in order to find them. Prior to resettlement many villagers had easier access to the Nakai-Nam Theun NBCA. Between 2006 and 2009 more households used the forests to collect fuel wood, herbs and mushrooms but the numbers collecting honey, rattan and bamboo products have decreased. The percentage of households selling forest products has declined since 2006 for all products except for *kisi* resin, which remains the most commonly marketed NTFP. Other NTFPs still gathered regularly from forest areas include bamboo shoots, cardamon, rattan shoots, and other fruits and vegetables [see Figure 12]. However the number of wild animals that have been caught has fallen which is a welcome development considering that the hunting and sale of wildlife is illegal in Lao PDR⁶⁹

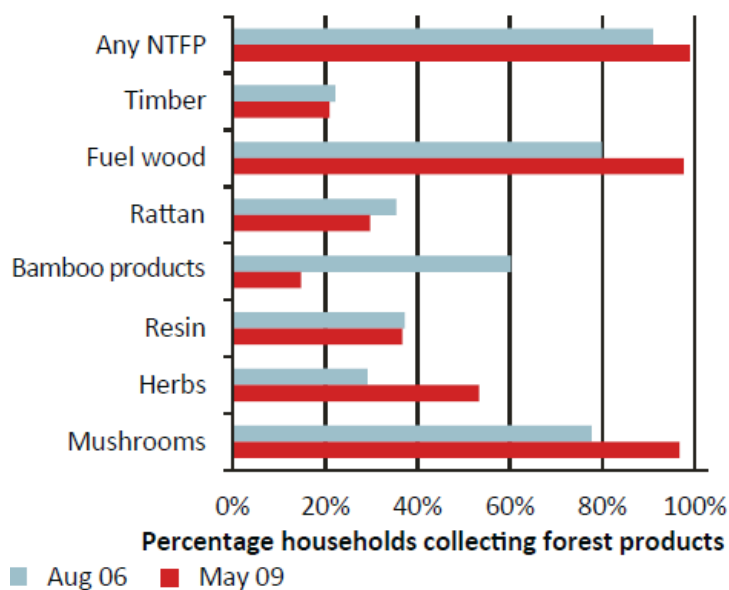


Figure 12: Percentage of Households Collecting Forest Products, 2006-2009

Source: Data from living standards monitoring survey (LSMS), NTPC

⁶⁷In 1998 there was hardly any *damar* resin left on the plateau and in the surrounding areas due to over-harvesting to make up for the loss of rice due to recent flooding.

⁶⁸Information received during PLUP discussions in Khon Kaen and Ban Done villages, Nakai plateau, 2010.

⁶⁹Information in this section is from the PLUP in Khon Kaen and Done villages and from Living Standards Measurement Survey (LSMS), NTPC, 2006-2009.

Change in access to NTFPs is one of the consequences of the project, and attempts to grow selected NTFPs domestically are already in progress including bamboo shoots, bong bark, rattan shoots and the vine beriberi [see Photo 11]. This initiative aims to help generate income for families as well as promote sustainable NTFP collection, so that forest resources are protected rather than depleted.



Photo 11: Domestic Production of NTFPs

Source: NTPC Resettlement Committee

Further to growing NTFPs domestically there was the establishment the Village Forest Association (VFA) ⁷⁰ in 2003. The association was given a concession of 23,000 hectares of forest to manage for a period of seventy years (World Bank 2010 p.22). Each resettled family has a representative in the association and this is to ensure that everyone benefits equally financially from any logging that is conducted in the forest, regardless of whether they are physically involved in the process. The VFA therefore aims to provide a significant income to the resettled communities, which is particularly important for vulnerable families.

The main objectives of the VFA are to develop the members' livelihoods and to generate income for the resettled communities. This includes cash dividends and access to opportunities to earn money from forestry-based activities. The VFA management plan includes the following activities:

- Sustainable timber harvesting, processing, and marketing of wood products.
- Sustainable harvesting, processing and marketing of NTFPs.
- Forest plantation development.
- Agro Forestry and grazing development.
- Outdoor and recreational tourism.

In the first five years the association aimed its commercial activities at the supply of wood to NT2 in order to build houses. In 2009 each family received its first dividend of approximately

⁷⁰ The VFAs, are made up of resettled households and were established through Regulation No. 484/KM.GOV on June 13, 2002.

1 million kip (US\$ 120) and the second of US\$ 150 in 2010 (total US\$200,000). The dividends therefore did boost the overall income of the resettled families so that there was more available for household consumption.

The plans are for the VFA to be financially self sufficient by 2014. In order to achieve this transition into a mature and viable business organization the VFA will require continued technical support, practical training, as well as GoL's assistance through policy and legislation that will facilitate the association's operations (World Bank 2010).

Actually, forestry has provided a substantial and ongoing income for all households from timber sales and NTFPs gathered from the reserve forests. Many jobs and further earnings have been generated for the resettled villagers as the sector has branched out into agro-pastoral forestry and value-added activities like furniture manufacture. Most importantly it has to become sustainable over the long term by engaging in extensive reforestation and accelerated regeneration as the existing tree stocks are being harvested. At the same time, VFA faces continued pressures which include the threat to its resources such as the illegal harvesting of timber on its land. This naturally reduces the amount of timber it can harvest for sale and the income it can generate through dividends for the resettled villagers. Effectively protecting the forest resources and strengthening the capacity of the VFA remain key priorities for the project as VFA dividends are an important long-term income stream for all of the resettled households, particularly for the vulnerable ones with limited labor opportunities (World Bank 2012 a). As mentioned by the 18th (a) and 18th (b) POE there have been some villagers in the resettlement area who have participated in the illegal logging and sale of rosewood from the villages' forests as they derive greater financial benefits in comparison to the irregular dividends that they receive from the VFA. Villagers are not aware of their forest ownership since they did not receive full ownership rights from the authorities and the right to conduct commercial timber activities. Moreover, no wood processing or furniture manufacture skill development has been given to the villagers and a wood furniture factory was not established for the VFA as was stated in the SDP (Mcdowell, Scudder et al. 2011 p.36).

Recently, the 20th POE brought attention to the forestry issue relating to the resettlement villages. It has been a saga of conflicting philosophies and interests, of foot dragging by agencies which felt threatened by the new institution, as well as mediocre planning and excessive taxation of a compensation exercise for the resettled communities. A lack of dynamism and transparency in management has also contributed to a loss of trust in the sector among villagers and a plundering of timber resources by unchecked outside interests and sometimes the resettled villagers themselves.

The harvesting of the resource has so far produced three dividends totalling US\$551,000 or an average of US\$460 for each resettled household with five members, with a fourth dividend being considered. According to the Resettlement Action Plan the annual return in dividends for resettled villagers was calculated at US\$240,000 and to be one of the two principal components of the new livelihood incomes.

Additionally the number of jobs for resettled villagers that were forecast to be created in the forestry sector did not materialize to any significant degree. In fact, according to sustainable forest management practices the actual harvesting quota is 6,000 cubic meters⁷¹ a year for all

⁷¹ By practicing sustainable forest management, the communities can harvest up to 6,000 m³ annually of timber on a sustainable basis from the 5,590 ha of production forests. They obtain additional income from controlled, well managed forest grazing and farming domesticated non-timber forest products.

the resettlement villages. However the VFA management has projected that if the current felling rates are maintained that millable timber as a resource will be close to exhaustion by mid-2015.

It has therefore reached a crisis situation. If the VFA management's forecasts are accurate and harvesting is maintained at the rate envisaged in the new but unsigned contract with the existing buyer, then it will not be possible to meet the total cut envisaged for the next three years. All dividends for resettled households would therefore cease from 2015 (Mcdowell, Scudder et al. 2013 pp.29-30).



Photo 12: A Village Forestry Association Visit

Source: Photo by NTPC Resettlement Committee and by Stan Fradelizi, 2010

5.5.3 Pillar 3: Reservoir Fisheries

Fish are caught for both household consumption and sale, and in 1998 contributed to 6% of the imputed and 4% of the total cash income (NTPC 2005 b chp:2) . Occasionally, a large fish or a substantial catch may be sold in the village market or at roadside stalls. More commonly small-mesh nets and traps catch many invertebrates, all of which are then eaten. Men fish in the mornings and evenings once before they leave for the fields and then after they return. Most of the fish are caught by cast nets in the rapids, or by deep-water gill nets. Bait and hooks are also used, but to a lesser extent. Children and sometimes women search the banks and shallows for frogs, aquatic insects and small fish that also supplement the family's diet.

Since NT2 was completed fishing has taken place in the reservoir, which undoubtedly is the major source of income for resettled people [see Photo 13]. In the NT2 Concession Agreement it is clearly stated that the resettled villagers are the main beneficiaries from the fish in the reservoir. These people have the right to fish in the reservoir for a period of ten

years from the project's commercial operation date⁷². Moreover, the project also provides families with boats (one boat for two families), a boat landing, fishing gear, a refrigerator, a small ice factory and training in fish processing (so as to add value and for conservation purposes). Resettled households can also fish anywhere outside of the conservation zones. All of this has provided resettled households with a unique opportunity to develop their livelihoods from fishing in the NT2 reservoir.

In the peak fishing season of 2009 each household was able to bring in 11kg per day, and in January 2010 the total fish catch reached 140 tons⁷³[see Figure 13]. Out of the total amount of fish caught in August 2010, around 72% was sold commercially. However most households also use fishing to boost household consumption and some engage in processing such as drying fish. In December 2009, 5% of the fish catch was processed, with the main products being *padek* (fermented fish) and dried fish (World Bank 2010 b).

Sixteen village fishing groups (VFG) were established in order to facilitate the management of fisheries. These VFGs are working together with the Reservoir Fisheries Association (RFA) and the Nakai district authorities.

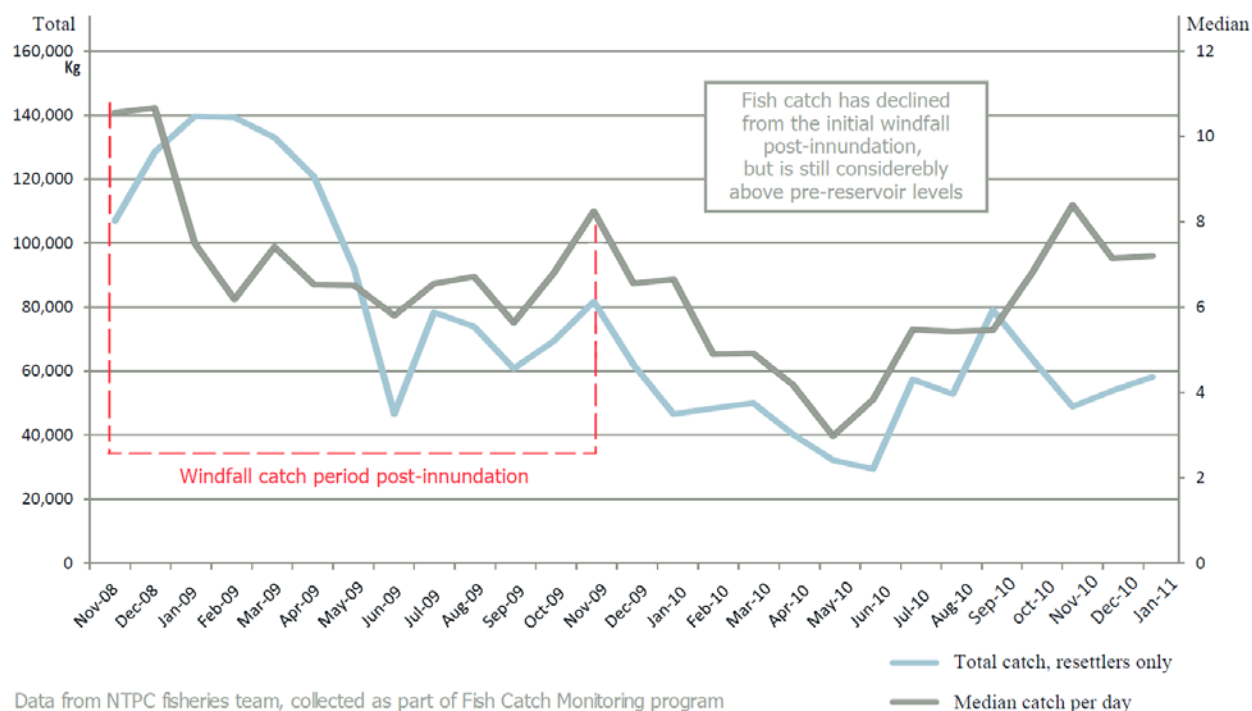
In addition to promoting effective and sustainable management this arrangement aims at empowering the local communities. The system is supported by NTPC and informally facilitated by external institutions such as the Living Aquatic Resources Research Centre (LARReC) and the Mekong River Commission's (MRC) fisheries programme. Consultations indicate that it has been well received by both resource users and local government staff.

Today, fisheries co-management is underway and through the PLUP process the VFGs have agreed on the boundaries that divide fisheries management responsibilities between the villages. Furthermore, efforts should continue to strengthen fisheries co-management institutions, particularly with regards to building capacities of the VFGs, the Reservoir Fisheries Association and the Reservoir Management Secretariat (RMS) (World Bank 2012 a).

Moreover, the main management challenge has been to secure the exclusive right to commercial fisheries for the resettled people, as the rich fish resources are attracting outsiders to the reservoir. The trading of fish is being controlled by the VFGs at the landing sites (point of sale), which is also where management fees are being collected. However, rule enforcement with regard to illegal fishing (people who have not been resettled fishing commercially) is being carried out through boat patrols on the reservoir (World Bank 2010).

⁷²According to a Decree No. 24/PM was forthcoming on 13 February 2008 that, among other requirements, stipulated in Article 7 "that the rights of fishing, fish processing and trading are reserved for the resettled communities for a period of ten years from the commercial operation date.

⁷³An average household, using the boat 15 days in the month could collect around 50-80 kg of fish in a month. In reality, households fish for fewer days, so the median household catch per month was 42 kg in August 2010.



Data from NTPC fisheries team, collected as part of Fish Catch Monitoring program

Figure 13: Total Monthly Fish Catch and Daily Fish Catch by Resettled Households, November 2008- January 2011



Photo 13: Fishing in the Reservoir

Source: Photo by NTPC Resettlement Committee

According to the 19th POE, reservoir fishing is not extracting as many fish as it was during the windfall days after it was first filled. The total catch in all zones including the Xe Bang Fai was up last year after the August/October floods but this finding actually went against the current trend. Overall there has been a downward trend which is quite noticeable in the figures for the resettled villagers fishing in the reservoir, where catches have declined from a high of 160,000 kg in December 2008 to less than 20,000 kg in November/December 2011 (Mcdowell, Scudder et al. 2012 p.13).

Nearly five years have passed since reservoir impoundment began in April 2008. As the 13th POE had predicted, the resettled villagers quickly responded to the new opportunity so that fishing in the reservoir has become the main activity and source of income for the majority of them, a situation which may continue indefinitely. The POE, after considering a NTPC suggestion that the ten year period should be extended, is convinced that the fishing in the reservoir should remain closed to outsiders for another ten years beyond April 2018.

After five years the status of the reservoir fish and fishery is still very much in flux and it is unknown how long it will take for the fishery to stabilize. If outsiders are allowed in they will likely bring a different and more efficient fishing regime that would destabilize current fishery practices. Consequently a substantial amount of additional time is needed under the present fishing regime to gather the necessary information to establish a sustainable long-term management of the reservoir's fishery.

Moreover, the 20th POE discussed the need for a ten year extension with Deputy Prime Minister Somsavat Lengsavad, the Khammouane Provincial Governor and the Nakai District Governor, all of whom supported such an extension (Mcdowell, Scudder et al. 2013 pp.28-29).

Actually, the reservoir fisheries are a critical component of the livelihoods of the resettled people and consequently it is supposed to be maintained for their benefit and not for that of outsiders. However, the reality is that outsiders are fishing in the reservoir in increasing numbers. A recent NTPC report on fisheries stated that, among other things, "...illicit landing sites...have proliferated near the dam site with reported catches in the amount of 800 kg/day/trader at one site alone (the amount suggests commercial-scale fishing)." The report also refers to increased transgressions elsewhere in the reservoir, and substantial use of the special conservation areas at the mouths of the watershed rivers, within the area protected by Watershed Management and Protection Authority (WMPA). In addition there is continued and often quite open collection of rosewood from the NBCA by the resettled people proceeding across the reservoir in fishing boats. Both to protect the fisheries and the biodiversity of the NBCA there is a need for very substantial improvement in the patrolling and management of the reservoir.

The resettlement area-based Village Fisher Groups (VFG) seek to monitor illegal use of the reservoir and aim to catch these people and stop illegal fishing. The NT2 Reservoir Management Committee does some occasional patrolling focusing on boat registration and compliance, and the WMPA has boat patrols apparently trying to focus on illegal activities related to flora and fauna of the NBCA.

GoL did agree to extend the resettled people's control of the reservoir fisheries for another ten years, and the extension was signed by the district governor after the Reservoir Management Secretariat drafted the extension document.

It was essential that that document was drafted and signed by the end September 2013 so that it could be implemented as quickly as possible. This showed the resettled hamlets that the reservoir fisheries are theirs to manage and protect and that as a result they can benefit from them for another fifteen years (Mcdowell, Scudder et al. 2013).

5.5.4 Pillar 4: Off-farm Income

There were only a few households which had access to off-farm income before the project. However, after the project, with NTPC's provision of community infrastructure such roads

there has been an increase in opportunities of market access and employment. Nowadays, many resettled families have a wide range of businesses to generate income including shops, guest houses and restaurants.

Some people have found employment with NTPC, VFA, in food and fish processing and through the provision of some other services. Textiles, wood carving and other handicrafts were originally identified as potential sources of off-farm incomes. However, only one textile handicraft group is currently operational, while wood carving seems to have practically disappeared despite the training which was provided by VFA.

Overall the data revealed that a relatively small percentage of households gained income from running a household business. The highest number recorded was 14% of the sample in 2008, although this did not include households who added value to their agricultural or fishing livelihoods by processing the products for sale. In the period from May to June 2007 during the construction phase, 48% of households reported incomes from wage employment from NTPC. However in 2009, after the completion of construction only 14% of households reported income from NTPC wages [see Figure 14]. This nonetheless represents increased access to wage income relative to 1998, when around 8% of households received wage income.

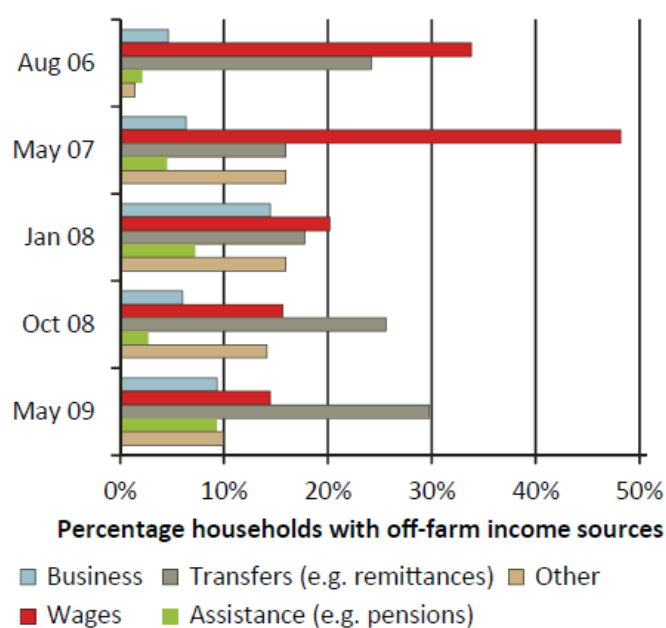


Figure 14: Percentage of Households with Off-farm Income Sources

Source: Living Standards Measurement Survey, NTPC, 2006-2009

NTPC is providing technical and financial support for members of the resettled communities to develop non-agricultural livelihoods [see Photo 14]. The joint NTPC and Lao Women's Union Community Development team helps groups to identify off-farm livelihood priorities, and provides them with skills training and initial capital to start up their businesses. As part of the training, the team has organized study tours for the lead households to visit other parts of the country and Thailand to learn about successful business models. Planned initiatives will also provide resettled people with access to credit, allowing them to firstly start up and then scale up their off-farm businesses in the longer term.



Photo 14: Off-farm Training Activities
Source: Photo by NTPC Resettlement Committee

5.6 Household Income and Consumption

NTPC is committed to raising the average annual income of resettled households to USD 800 (at June 2002 values) at the start of fifth year after relocation which is also above the national poverty line. Both the government and NTPC are also committed to an ambitious “best endeavour” target, which involves raising the average income of households in the NT2 resettlement area above the national average rural income level or to an alternative level equivalent to \$1,200 (at June 2002 values) by the ninth year after relocation, (Porter and Shivakumar 2010)

Table 3 shows the income distribution among households on the plateau at the time of the baseline survey that was conducted in 1998. In that year 58 % or 668 of the 1,160 households had an annual income of USD 400 or less while 32 % or 377 households had an income between USD 401 and 800. As in most communities there are a few households with a relatively high income which was 6 % ranging between USD 801-1,200 and 4 % with more than USD 1,200 (NTPC 2005 b chp:2 p.24).

Table 3: Income Distribution for Nakai Plateau Households According to Income Tiers, 1998

Income (USD)	Interval	Sample	Total No. of HH	Relative share, %
1-400		181	668	58
401-800		102	377	32
801-1200		20	74	6
>1,200		11	41	4
Total		314	1,160	100

Note: USD 1 = 4,162 Kip

In relation to the sources of income figure 15 indicates that agriculture and livestock accounted for the bulk of income (66%), while other significant sources of cash income for 15% of households were wages and jewellery sales. Incomes from fishing, NTFPs and wildlife were also important as they each provided around 10% of households with an income (World Bank, 2010). Only a few of the households in the wealthier villages had paddy land, while the poorest households were not in possession of land that was suitable for rice cultivation, and therefore relied mainly on NTFPs for subsistence. Some households sold or bartered with forest products and occasionally livestock with merchants in Ban

Oudomsouk. However it should be noted that it is mainly a subsistence lifestyle with at least 55% of household income being in-kind, namely from crops produced and consumed by households⁷⁴.

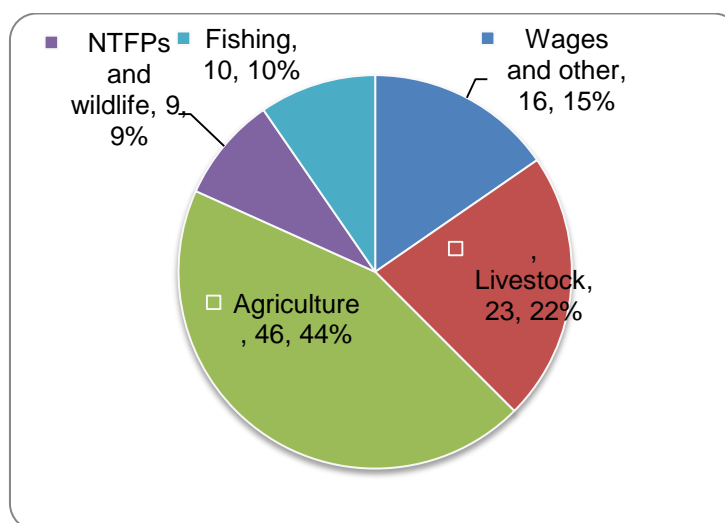


Figure 15: Composition of Household Incomes prior to Resettlement (1998 Baseline)

Source: Data from Social Development Plan (SDP), volume 2, chapter 2, NTPC website. The exchange rate of 4,162 LAK/USD was the rate used in 1998's SDP.

According to five surveys that were undertaken after relocation between August 2006 and June 2009 the household income levels were well above baseline (WB and ADB 2010 p 11). Prior to the project the villagers' per capita income level was approximately 1,6 million kip per year [Figure 16]. This income level is under the national poverty line as well as the international poverty line of 1.25 dollar per day. After the relocation per capita income increased dramatically, although the income of vulnerable family members' did bring down the average. Current per capita income has almost reached double of what it was in 1998.

Given the disruptions caused by physical relocation and the challenges of livelihood improvement, there has been a fluctuation in incomes. On average, the total per capita income increased slightly between 2006 and 2007 but then fell in the period leading up to January 2008, when many of the villages experienced disruptions due to relocation. However in late 2008, per capita income began to rise and then 2009 saw further improvements [see Figure 16] (WB and ADB 2010). Along with the increase in income and consumption levels since 1998, there has been a significant shift in the sources of income (e.g. fishing), which do not depend on project-related employment or subsidies.

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Data in this section comes from Social Development Plan, Volume 2, Chapter 2, NTPC website. http://www.namtheun2.com/index.php?option=com_content&view=article&id=91&Itemid=102

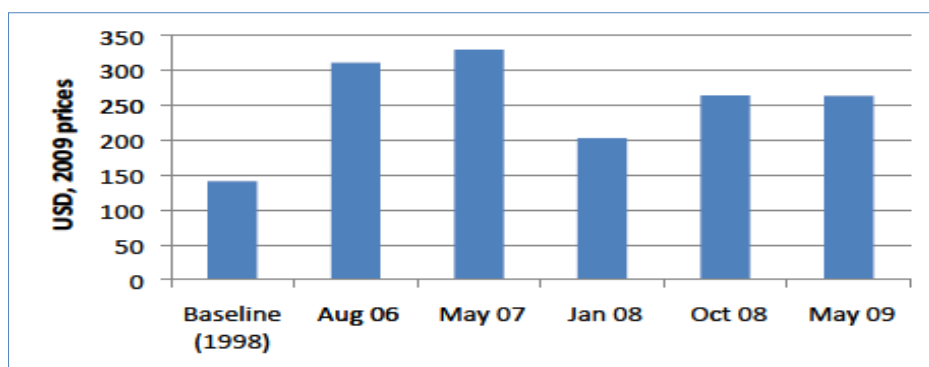


Figure 16: Median Total Incomes, Excluding Transfers and Wages from NTPC, 2009
(Yearly income per person in USD at the 2009 rate)

Source: Data from the Living Standards Measurement Surveys, NTPC (WB and ADB 2010)

However it should be noted that the means by which the income was doubled is not sustainable. The SDP expected the income of the resettled people to come from dry season cash crops grown on the newly irrigated land, commercial livestock, dividends from the FCA's wood processing operations and fisheries in the project reservoir. The reality today is that the major sources of income are from the sale of rosewood (*Dalbergia. SPP* or *Mai Ka Young in Lao*) which comes from the reservoir's watershed areas - an NBCA - which is illegal and not sustainable, as well as from fisheries in the reservoir (Mcdowell, Scudder et al. 2011).

Figure 17 and Figure 18 show the composition of income sources for villagers in 2006 and 2009. Although it has taken time for households to adopt new farming techniques, many of the households were quick to benefit from bumper fish stocks in the reservoir. As a result, the average income share of fishing, which stood at 27% in 2006 increased to 44% in 2009, while in the same period the average income share of agriculture remained the same at 22%.

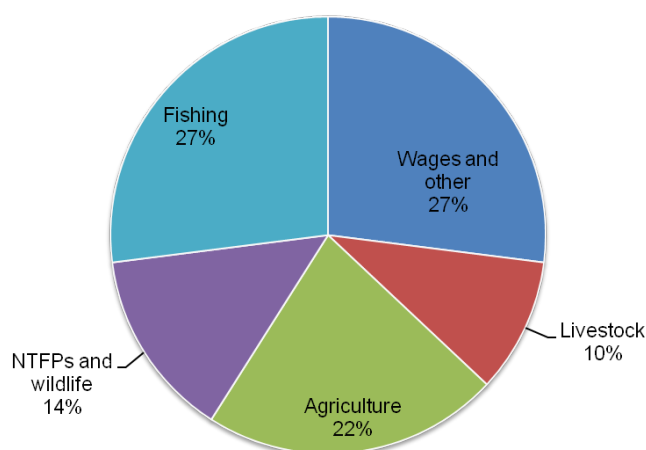


Figure 18: Average Income Share of Each Livelihood Pillar, Aug/Sept 2006

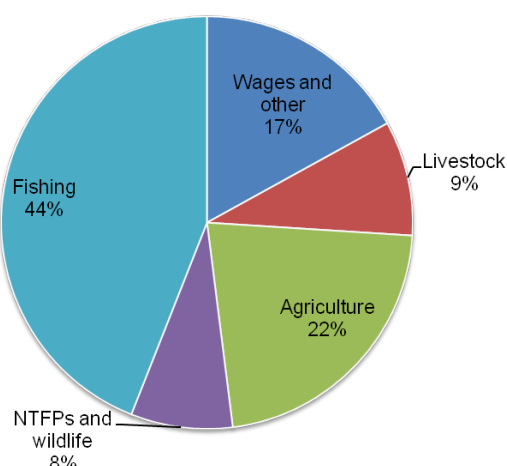


Figure 17: Average Income Share of Each Livelihood Pillar, May/June 2009

Source: from "Update Nam Theun 2 Hydroelectric Project (2010 a)

Actually, NTFPs as well as livestock remain important for the livelihoods of many households. There appears to be a welcoming trend towards more sustainable methods of raising large livestock. These include cut-and-carry fodder instead of free-roaming grazing, mineral inputs and vaccinations. It is important as the large livestock numbers are near the plateau's carrying capacity. Finally, agriculture remains one of the key sources of many resettled villagers' livelihoods. Irrigation infrastructure in all the villages, as well as the construction of complementary gully dams to improve the water table next to the reservoir draw down zone has now been completed. Water user groups have been established and trained in all of the villages. Rice yields are coming in well above the average pre-resettlement production levels (World Bank 2012 a p.16).

According to the findings of the Nakai socio-economic survey's round 6 (May 2011, page 92) only 13 % of resettled households' income comes from agriculture and livestock. As for irrigation activities, less than 4 % of households were using them during the 2011-12 dry season (Mcdowell, Scudder et al. 2011 p.26).

Recent socio-economic monitoring survey results indicate that nearly all (apart from two) of the households in the survey sample are now above the Lao PDR's rural poverty line, which befits NT2's income target. This suggests that steady progress has been made towards meeting the NT2 socio-economic targets, which were due to be measured in 2013, five years after relocation. Figure 19 below shows that the average per capita consumption is well above the rural poverty line for all of the income categories. Additionally there is the trend to purchase food instead of producing it as villagers have more diverse sources of income. Although consumption and income levels do indicate improvements in the resettled villagers' living standards, it is important for the project and government agencies to stay focused on building support mechanisms for the most vulnerable households and enhance the sustainable management of current and future sources of income (World Bank 2012 a p.14).

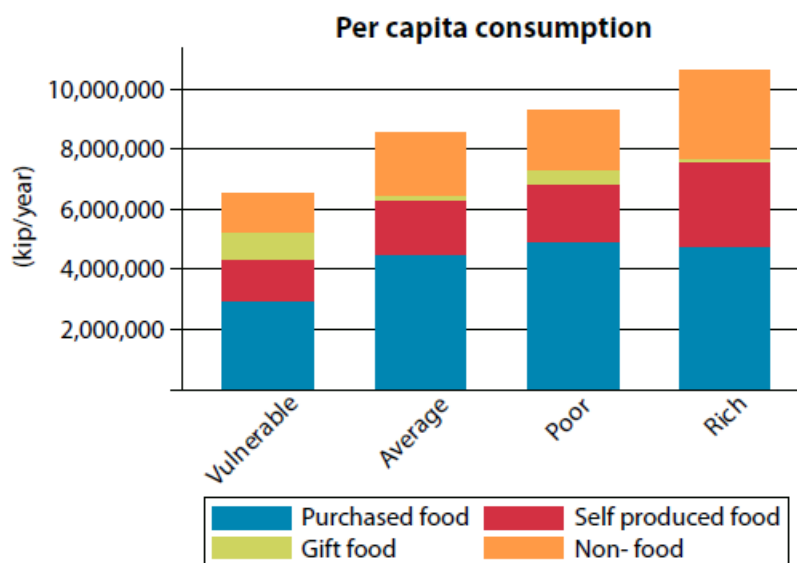


Figure 19: Per Capita Consumption among the Resettled Community in Comparison to the Rural Poverty Line - 2011

Source: Data from the Living Standards Measurement Surveys 6, NTPC

5.7 Education and Health

Further to ensuring that resettlers are materially better-off, the project aims to improve non-monetary outcomes to mitigate risks arising from the social changes caused by resettlement. Education and health are part of a broader understanding of the concept of well-being. The education and health of the resettled villagers' are central to guarantying the success and sustainability of their livelihood strategies. The project has invested in physical infrastructure, including schools and health centres, so as to improve the resettled people's education levels and health status. Additionally the project has invested in the capacity building of district government and staff, to help ensure that improvements in these sectors are sustainable.

5.7.1 Education

Looking back at education indicators in 1998 before the development of the project, 48% of households were illiterate and only 10% had progressed beyond primary school. Moreover, literacy levels were even lower among women and the elderly.

Generally the education facilities were scarce and of poor quality and children dropped out of school at an early age in order to help their families with farming and economic activities. In 1998, only 31% of 5-9 year olds, 10% of 10-14 year olds, and 6% of 15-19 year olds were enrolled in school⁷⁵(NTPC 2005 b chp:2 p.26, World Bank website 2010 b). As can be seen in Table 4 the literacy level was very low on the Nakai plateau at that time as 70% of population had received no schooling.

The project's education programme has focused both on the construction of school infrastructure and capacity building. Firstly sixteen primary and sixteen nursery schools were

⁷⁵Information from SDP Social Development Plan NTPC website

http://www.namtheun2.com/index.php?option=com_content&view=article&id=91&Itemid=102

either built or renovated. Education support has been on-going, in conjunction with the District Education Office and the Village Parent Student Associations. Kindergarten teachers have been employed and food support for school children also continues to be provided. Ensuring that the initial investments in education are translated into sustained improvements in educational outcomes is going to be an ongoing challenge for district educational authorities.

Table 4: Education and Literacy Levels on the Nakai Plateau

Level	No. of People	% Population
No schooling	3,076	70
Primary School, 1-5	1,526	31
Secondary School, 1-4	214	4
High School, 1-3	43	1
College	8	0.2
Institute	5	0.1
University	7	0.1
Semester/ Master	1	0.0
Other	9	0.2
Total	4,889	100

Source: Baseline Survey in 1998

Figure 20 presents enrolment data of children from vulnerable households and non-vulnerable households during the academic years previous to the surveys conducted in 2006 and 2009. In 2006 almost 60% of children of primary school age from the non-vulnerable households were enrolled, which was already significantly higher than the 1998 level. For the primary school children from vulnerable households the increases were slightly lower as the enrolment rate stood at around 50%, which however was still well above the baseline level. Over the project period enrolment has increased significantly, and the gap between children from vulnerable and non-vulnerable households has almost disappeared. The enrolment of children aged 5 to 9 was raised to about 90%, which means that roughly 700 children, who would otherwise most likely have missed out on an education all together, are now attending school.

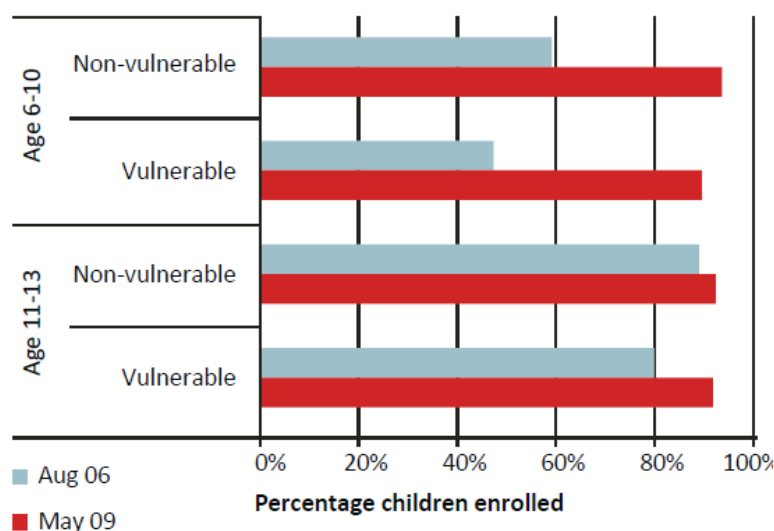


Figure 20: Percentage of Children Enrolled in School

Source: Nam Theun 2 Resettlement: Taking Stock Halfway Point 2010

Table 5 presents the enrolment rate of pre-school, primary and secondary school children in the 2010-2011 academic year. It should be noted that the resettled children's access to education is relatively higher than the national average, especially for 3-5 and 11-14 year olds. However, the most important challenge now is to ensure the continuity of education for these children. Data regarding the drop out rate of resettled children is not available, but at a national level the drop out rate is considerably high at 11% for 11-14 year olds and 8% for 6-10 year olds. (MOES Website 2011)⁷⁶. The family's economic situation and the parent's education play a significant role in the children firstly enrolling and then completing their education.

Table 5: Access to Education among Resettled Children Compared to National Averages 2010-2011

Description	Nakai Resettlers (2010-2011) %	National average (2010-2011) %
Early childhood attendance (3-5 year olds)	38 %	24.5
Primary age attendance (6-10 year olds)	91	94
Secondary age attendance (11-14 year olds)	74	63

Source: Data from the Living Standards Measurement Surveys 6, NTPC and Ministry of Education and Sports, Education Statistics

5.7.2 Health

The Nakai plateau was inaccessible by road before the development of the project, which made it difficult for households to receive basic health services or to see a qualified doctor or midwife. The maternal and child health care services were unavailable and so both women and children experienced high morbidity and mortality rates. In emergencies it was almost

⁷⁶ <http://www.moe.gov.la/index.php/lang-en/statistics>

impossible to get to the doctor on time due to the non existence of roads. The healthcare facilities at that time consisted of one district hospital, five health centres, and one malaria unit under the district health office. The centres were inadequately staffed and poorly stocked with essential medicines and first aid supplies. Most villages did have a designated village health volunteer, who however seldom had the necessary medical supplies or skills.

Poor sanitation and a lack of understanding of basic hygiene, as well as access to clean water further compromised health outcomes. Water was taken mainly from the river and in some cases from natural springs. Only the large villages had regular access to potable water sources throughout the year. Furthermore only a few of the households boiled water for drinking and so the combination of such practices resulted in plateau households faring poorly on many health indicators. Child malnutrition and the prevalence of parasitic infestations were unacceptably high, even compared to other poor households in Lao PDR (World Bank 2010 b).

The aim of the project health programme is to strengthen the existing health system by providing technical advice and financial support. It is essential that the improvements are sustainable, and therefore the programme works in close collaboration with the government staff and uses existing government structures. The implementing agency is the government health sector at all levels whether it be provincial, district, or through health centres and village health volunteers. The programme works through several areas of intervention, including infrastructure development and support, capacity building and training, health education and awareness programmes as well as surveillance and monitoring. Focus on the prevention of disease and health education for sustainable self help have been the priority (World Bank 2010 b pp.32-33)

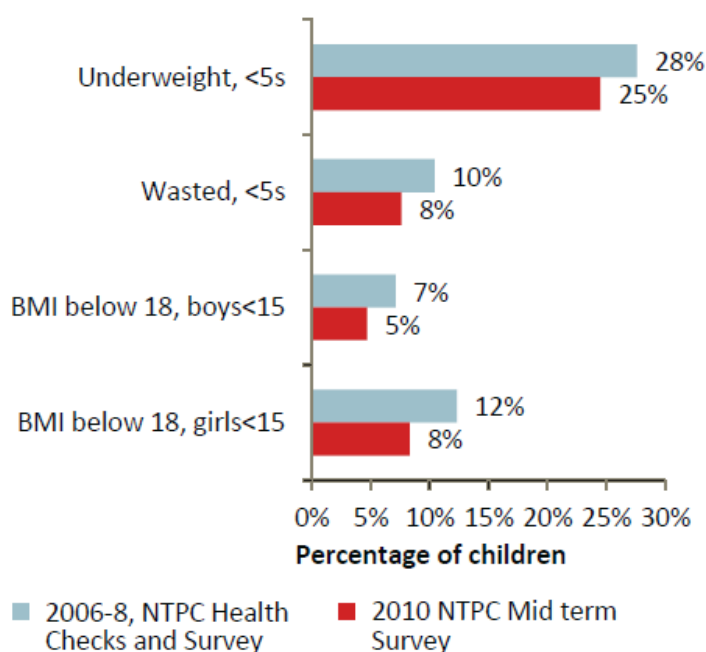


Figure 21: Percentage of Children Underweight

Source: Data from NTPC Health Performance and Monitoring Unit

The baseline survey indicated that child mortality rates were shockingly high. When interviewed as part of the health checks which were carried out before resettlement, 50% of the women aged between 25 and 44 reported that they had lost at least one child.

Unfortunately the rates among older women were even higher⁷⁷. Since 2007, monthly maternal and child health clinics have been active in all the villages and there are other improvements, such as the provision of safe water that have made a real impact on the health of mothers and children. For instance, the nutritional status of children under 5 has improved considerably [see Figure 21]⁷⁸

Before the project started, almost 70% of individuals were suffering from parasitic infestation. This number fell to 46% after the provision of a safe water supply and sanitation, and further declined to 17% after mass treatment with Mebendazole. By January 2010, the rate had fallen further to 7.4%. The health of the resettled populations has already improved considerably, as is indicated by these initial data. However many challenges remain and NTPC will continue to provide the required support to the provincial health services and the health workforce in order to achieve the ultimate goal of sustainability (World Bank 2010 b pp.33-34).

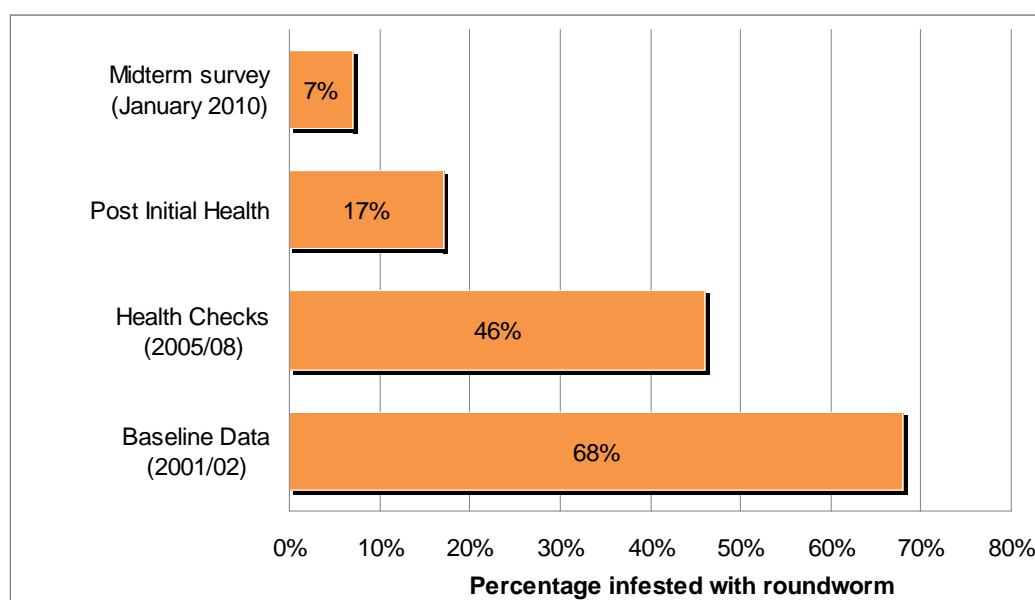


Figure 22: Prevalence of Roundworm Infestation in the Resettled Populations, 2001-2010

Source: Data from NTPC Health Performance and Monitoring Unit, 2001-2010

The NTPC Health Programme Management Unit has published the results of a survey conducted in January 2011, comparing the health status of the villagers in Ban Nahao in the Navang cluster with the resettled populations on the plateau. Ban Nahao was considered to be a comparable village to the resettled population before the resettlement process. The differences in health status between the two populations are striking, notably with a very significant improvement in the status of health of the resettled population. It is clear that the

⁷⁷Health Checks for Resettled Populations, December 2005- February 2008, Resettlement Health Program, NTPC

⁷⁸Data on child mortality have been collected since resettlement took place in 2008. However, because the time period in question is short and the population is relatively small, these figures cannot yet be used to demonstrate the considerable improvements that have taken place, or to compare them with national figures.

health efforts in the resettlement area have been remarkably successful and that their experience can be applied to other watershed populations (Mcdowell, Scudder et al. 2011 p.6).



Photo 15: The Health Centre at Ban Navang

Source: Photo by Mcdowell, Scudder et al. 2011 p.13)

A few examples taken from the final health checks survey for the people living on the Nakai plateau in February 2013 illustrate why this is the case. Firstly, the former very high incidence of stunting on the plateau in children aged less than five years has been reduced from 43% to 34% in four years – this is still comparatively high, but the trend is favourable. Secondly, the very high percentages of multiple parasite infections across the plateau population has been reversed since records were first kept. The reduction is from more than 90% with such infections to nearly 80% with no infections. Furthermore the 43% of adults who had malaria at the time of the base line study has been reduced virtually to zero. There was not a single malaria case reported in this year's survey. Significantly also child mortality rates have been halved in four years, from 120.5 per 1,000 to 59.4 per 1,000. These figures add up to a big boost in the quality of life of the villagers and they are very appreciative of this fact (Mcdowell, Scudder et al. 2013).

5.8 Community views

Many villages and households have already reached or surpassed the project's income targets, but progress so far has been uneven. The resettlement programme continues to register positive progress on post resettlement livelihood restoration and movement towards income targets set out in the CA, and efforts remain focused on making new livelihoods sustainable. An extensive livelihood monitoring programme is in place, and available socio-economic data shows that the resettled people's income is clearly above the baseline income levels. Please refer to a fuller discussion of these issues in the "Nam Theun 2 Resettlement: Taking Stock at the Halfway Point 2010"⁷⁹. While full analysis of recently collected survey information should have become available late 2012, initial results indicate

⁷⁹The publication can be found on the World Bank's website at www.worldbank.org/laont2

that specific quantifiable income targets for households have already been met for almost all people (of the roughly 6,300 resettled people on the Nakai plateau). The data also shows that a very high proportion of resettled people in different income categories still consider themselves better off following resettlement [see Figure 23]. However, there is considerable variation in incomes across villages, households and time periods. NTPC intends to undertake further research to better understand why that is the case. The livelihood improvement targets (representing a significant increase over baseline income levels) in the CA should have been measured in 2013 in order to judge whether the contractual resettlement implementation period can come to an end.

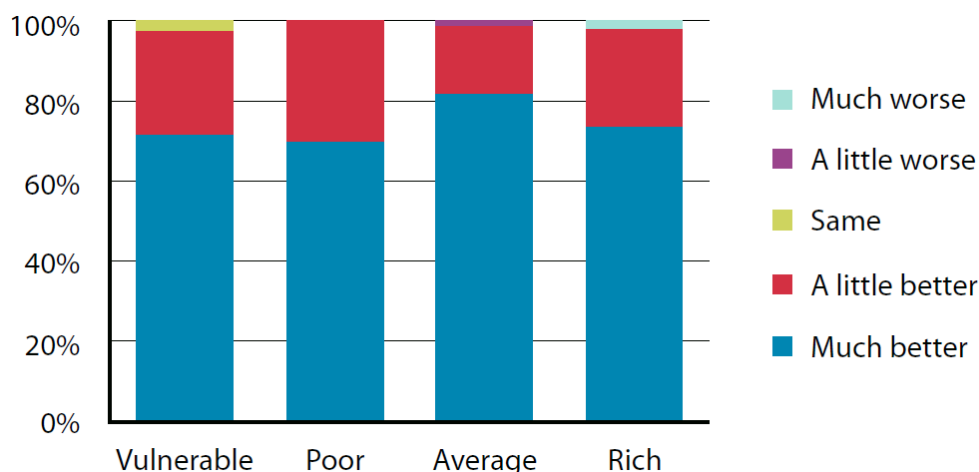


Figure 23: How is your life now compared to your life before the NT2 resettlement process?

Source: Prepared by NTPC

A speech by Deputy Prime Minister, Minister of Foreign Affairs, H.E. Dr. Thongloun Sisoulith which was published on "Nam Theun 2 Making a Difference" included the statement:

"NT2 is important for the people of Laos as it creates tremendous benefits at the national and local levels" (World Bank 2010 c).

Mr Jean-Piere Katz CEO of the Nam Theun Power Company further added:

"People of Nakai, for the first time, have good schools, clinics, rice mills, electricity and water supply. They are healthier, stronger and have many more possibilities in their lives"(World Bank 2010 c).

In an interview in the documentary "Voices of Nakai" the Governor of Khammouane province Mr.Khambay Damlath commented:

"The local community, especially the people of Nakai have benefited tremendously from NT2. Nakai plateau used to be one of the poorest areas in our province as well as in the country. Today the people have improved housing, health care, and greater employment opportunities and the children have better access to education. NT2 has helped the overall development of Khammouane province. Moreover, the project helps them to change their approaches to making a living and ultimately to rely on themselves. It is our priority to help them with their livelihood issues and to create employment in a way will make their living conditions stable and sustainable"(World Bank web site 2010 a).

A resettled villager from Ban Boua Ma, Mr Souk Gnomny stated: *“There have been so many changes, and my family’s livelihood has changed for the better. Now it is easier to make a living. So in the old village, we had to walk for 2 km just to get drinking water and now it is just a short distance from our house”*(World Bank 2010 c).

Mrs Aeng in Ban Boua Ma commented: *“Now there is road access, and the kids will have a better future as they can go to school and we have clean water. Honestly, I wish to have more land to grow rice. We have allocated land, but there are 8 persons in my family. It is not enough, and before we had slash and burn cultivation, but we cannot do that anymore. This is a difficulty”*(World Bank web site 2010 a).

NT2 is making a difference by improving access to education as highlighted by Mrs Aeng’s comparison of the educational facilities in resettled village with those that they had previously:

“It is different in the new village. We have a better road and our children have a school with better facilities. Before my child had to travel far over the mountain in order to get to school. Now, the school is very close to our house” (World Bank website 2010 b).

NT2 is also making a difference by creating new opportunities for resettled people. An example is Mrs. Orm who has been resettled with her family in Ban Boua Ma. She is currently running her own shop outside of her new home and declared:

“We sell groceries, food and drinks. We are also thinking about expanding our business. In 2010, we did not grow rice, but instead planted corn near the house. We use the profits that we make from the shop to buy rice for our family. There are four people in our family and my daughter and husband are helping whilst my son is still in school. The shop makes a stable income and we can all live off the earnings that we make. Life has become better and there are more opportunities now and so far we have gone for the challenge”.

Since resettlement, the villages are linked by road and so the local economy is developing. It gives the resettled households access to markets and employment opportunities and many resettled villagers are already earning off-farm income. In fact in 2009, 61% of resettled villagers’ income came from various off-farm income sources, including fishing and wages. The challenge of sustaining new livelihoods continues (World Bank website 2010 b) as for example they now have become dependant on fishing. However this is unreliable as a trade, and in the future it will be hard to cope with the cost of living as they become more integrated into the market economy.

International Rivers’ letter to the Nam Theun 2 Power Company noted the following findings from a field visit to the Nam Theun 2 project area in September 2011:

On the Nakai plateau, it is apparent that the material wealth of the villagers has improved since before the dam was built. We heard many people express appreciation for the roads, health centre, school, new houses, water, electricity and other amenities provided in the new villages. However, villagers continue to remain concerned about their longer-term food security, and as has been noted in other reports, the shift from a subsistence economy to a largely cash economy has not been an easy one for many people. Many people reported that it was easier to get food in their old villages than it is in the new villages. It is clear that the two main sources of income for villagers now are reservoir fisheries and illegal logging from the community forest area and the watershed area. Many people reported that reservoir fisheries are declining and that intruders from Lak Sao continue to find their way into the reservoir to fish. The reliance

on illegal logging is obviously unsustainable and raises serious questions about the future viability and protection of the watershed area, which was one of the justifications for building Nam Theun 2 in the first place (International Rivers website 2012).

5.9 Capacities and Interests of the First and Second Generation of Resettled Families

There is a requirement for a fresh and updated assessment of the resettled villagers' strong and weak capacities as well as their needs and interests. This will help to focus the activities of the Village Extension Workers, and guide the development of a necessary new vocational training centre on the site of the old Italian-Thai facility in Gnommalath or the Phonesack sawmill on the Nakai plateau which will serve to measure the degree to which the CA requirements for training of PAPs are being met.

Good progress has been made in bringing the 0.66 ha plots into production. However some villages are obviously more preoccupied with the quick returns from rosewood collection and fishing. Sixty percent of resettled households have cleared their plots and sown crops with a high proportion choosing rain-fed rice. Although they have largely followed the no-tilling aspect of the agro-ecological model that was recommended, most have in effect not carried out the suggested mulching but have reverted to techniques akin to the slash-and-burn system of old. This was actually predictable as it is what they know, and the system that they have followed for decades, which is successful so long as the fields can be rotated. But there no longer are unlimited new areas to break in while the used plots lie fallow for years. The lesson here seems quite clear: resettled people who have been required to adapt to a whole new way of life over the past five years will revert to their old unsustainable methods if they are not convinced of the efficacy of the new ways. There is still work to be done by the village extension staff to encourage the farmers into adopting more intensive agricultural techniques.

Unfortunately there is much less progress to report in regard to the use of the new, relatively high tech and expensive irrigation systems which were installed - as required by the CA - to supply dry season water to 0.16 ha of the 0.66 ha plots. At the last count only one hundred farmers or so out of just over 1,300 households used the new irrigation systems during the 2010/2011 dry season. Some chose instead to use the old irrigation methods near their homes (where they could keep an eye on crops while they matured) and, having experienced the rapidity with which hillside soils absorb water through percolation, tended to use hoses to sprinkle their dry season vegetables and fodder crops (McDowell, Scudder et al. 2011 pp.12-13).

This was not solely due to a failure on the farmers' part to adapt to new and strange methods. The reality is that several practical problems arose in the new irrigation systems: bores dried up much faster during the dry season than anticipated and pumps broke down, with one apparently being put out of service by a lightning strike. More use should also be made of more basic irrigation systems, such as extra gully dams (15 have been completed to date) as the resettled villagers are familiar with their construction and use (McDowell, Scudder et al. 2011 p.13).

As an increasing number of second generation family members are growing up in an NT2 project environment and benefiting from an education, it also means that their goals and interests are changing. While the focus of some has already moved beyond becoming

farmers and fishermen, the reality is that local, national and international employment opportunities are such that a village based livelihood will continue to be the only family supporting option for the vast majority. It should be the responsibility of the NT2 project to anticipate their changing interests by offering a wider range of village based farm and off-farm occupations. It should also provide more accessible post-secondary school education to train second generation family members to diversify village occupations and to qualify for employment elsewhere.

The 18th (b) POE report suggested that GoL and NTPC have a responsibility to provide the expertise and funding to initiate a wider range of farm and off-farm activities including greater emphasis on agro-forestry and the cultivation of non-timber forest products, through the recruitment of a NRO specialist to promote these activities. NRO training in off-farm employment continues to emphasize on a relatively limited range of activities which are primarily for women such as fish processing, weaving, gill-net mending, hairdressing and handicrafts. It should be noted that these activities must not be neglected; and indeed they need be increased along with improvements in marketing⁸⁰.

As for a wider range of off-farm activities, emphasis now needs to be placed on training carpenters, electricians, masons and mechanics for the maintenance of resettled communities' houses and equipment, the village's appearance, water supplies and structures, as well as access roads.

Project assistance in the form of credit and expertise is also required to help second generation men and women start a wide range of businesses. As during previous visits, the 18th (a) and (b) POE noted a gradual increase in village based off-farm enterprises. One example in Nakai Neua was the new workshop of the headman's son to repair vehicles, motor bikes and boat engines. In Thalang a young female entrepreneur, with only a grade 5 education, set up an ice plant capable of making block ice for the fishing industry and ice cubes for home consumption; a facility which put the NT2 project's non-functional ice plant to shame (McDowell, Scudder et al. 2011 p.14).

5.10 The Handover Process

The handover process of various resettlement projects and activities such as the village forest association, health centre and other village infrastructure from NTPC to the resettled villagers as well as district and provincial authorities is well under way. As commendable as this is, the 20th POE has two major concerns with one relating to staffing and the other to monitoring. PM Decree 471 requires the Nakai district staff to take over NTPC's Watershed Management and Protection Authority's development obligations for the 32 NPA villages. The agricultural, education and health staff that are required for this task do not exist; indeed Nakai district does not have the permanent staff to implement the NTPC Resettlement Office's current agricultural programme or to staff schools and clinics once the handover occurs. The POE, seeing no clear solution to this issue, is very concerned about the

⁸⁰The POE noted the complaint of one weaver, namely that while the price of weaving material can and has been increased, there had been no accompanying increase in the price set for the woven good.

implications for meeting CA requirements for improving the resettled communities' livelihoods by 2015 and for implementing Social and Environment Framework and First Operational Plan II (SEMFOP II).

Round 6 (May 2011) of the Nakai Socio Economic Survey turned out to be an impressive monitoring document. The POE is concerned, however, that the balance between consumption and income is too heavily favoured on the consumption side. The POE questions whether "consumption is generally considered to be a better indicator of household well being than income," nor does it believe that opinion warrants a "one fits all" conclusion. Indeed, the POE questions whether or not it fits development contexts including large dams, in which early emphasis is placed on significantly improved infrastructure such as roads, schools, clinics, electrification, houses, household furnishings and other purchases and where initial sources of income from construction activities cannot be maintained. In such situations the POE believes not only that equal emphasis be placed on consumption and income, but also that monitoring place more emphasis on maintenance, depreciation and debt. Some comments from the 21st POE addressed these issues:

"That government officials at the central, provincial and district levels prioritize discussion on ways in which Nakai district can meet its future budgetary, staff and capacity responsibilities.

That the next round on the Nakai Socio Economic Survey and all future monitoring, place equal emphasis on consumption and income and include data on, for example infrastructure maintenance, depreciation, household debt and access to a range of stable and legal income sources.

That a special effort be made to delete income from rosewood and other illegal activities from the resettled people's income and that careful surveying of their debt continues" (McDowell, Scudder et al. 2011 p.25).

6 IMPLEMENTATION OF DOWNSTREAM MITIGATION

The overall approach to compensate the losses for people living in the downstream areas of NT2 was firstly to identify the impacts on assets and livelihoods of villagers in order to identify and plan the offsetting measures that meet the requirements specified in the CA. The delivery of household and community assistance was done mostly through the villages but also at a district and provincial level.

In January 2008 NTPC proposed a revised US\$16 million Downstream Implementation Plan to the GoL and the International Financial Institutions. This provides a complete analysis of the project's expected physical impacts, the consequent social and economic effects, as well as measures defined in relation to the specific anticipated impact for each area.

The Downstream Programme's mitigation, compensation and livelihood restoration activities involves people living along the Xe Bang Fai mainstream, from the junction of the Nam Gnom (located approximately 11 km upstream of the confluence with the downstream channel), to the Mekong River. It includes villages not located along the Xe Bang Fai mainstream but who rely on the Xe Bang Fai for fish or aquatic products

The Downstream Programme also covers villages that rely on the impacted waterway for fish or aquatic products (specifically villages in Khamkeut district and in the Nam Theun hinterland) and will take into account any impact on historical or spiritual sites and temples.

During its implementation the Downstream Programme produced extension and training materials regarding livelihoods (crops, livestock, aquaculture, fisheries) in various formats such as leaflets, handbooks, posters or videos - mostly only in Lao. This material was developed between 2008 and 2012 in the context of the Xe Bang Fai area for the purpose of the Downstream Programme itself. However a revised version has also been made available on the NTPC website⁸¹ for reference and for possible adapted use by other rural development stakeholders in Lao PDR (NTPC website 2013).

A Downstream Programme is in place to address NT2's impacts in the Nam Theun and the Xe Bang Fai river systems. Downstream impacts on the Xe Bang Fai are a more critical issue as power generation brings about changes in water flows. While the Xe Bang Fai is the most significant zone with respect to size and the nature of impacts, it is important to remember that the NT2 "Downstream Areas" designation formally covers the following three zones:

- i. Downstream of the power station, including around 150 villages along the Xe Bang Fai and in its hinterland.
- ii. Downstream of the Nakai Dam, including 38 villages along the Nam Theun.
- iii. Upstream of the reservoir, including 31 villages in the watershed area, which are impacted by backwater from the reservoir (only the two first downstream zones will be examined) (Work Bank 2010 a).

Implementation of the Downstream Programme (DSP) is the joint responsibility of the GoL and NTPC and is carried out according to a mutually agreed plan. The CA stipulates that the DSP will operate for five years after the start of commercial operations date, which will be April 2015. However, NTPC's contractual obligation is limited to US\$16 million in addition to

⁸¹<http://www.namtheun2.com/environent/downstream-programme.html>

other specific monitoring programmes such as water quality and socio-economic surveys. IFI grant and loan agreements have already been concluded between the GoL and IFIs which require the government to continue implementing key DSPs as the US\$16 million ran out prior to programme completion (World Bank 2012 a p.20).

6.1 Nam Theun Downstream

NT2's site selection meant that there were no villages immediately downstream of the dam in the district of Khamkeut. The combination of a steep river bed with numerous rapids, reasonable water quality, the riparian flow released at the dam, and natural tributaries joining the Nam Theun, all combine to reduce negative impacts on the downstream communities.

Environmental mitigation is proposed through a guaranteed minimum riparian release (2 m³/s) and supplemental spillage during the wet season. NTPC is taking an adaptive management approach to the issue, which will provide some opportunity to refine riparian flows through dam operations. An agreed compensation framework and programme has been discussed and delivered to affected villagers.

In 2007, the IFIs recommended that NTPC should develop a plan to provide some emergency food support to prepare for the possibility of a short term negative impact from the discharge of poor quality water as a result of the decomposition of biomass in the newly-formed reservoir. A monitoring programme was put in place to check on any negative impacts in the 37 villages downstream from the Nakai dam.

Grant-based investments are underway in these villages as part of the compensation programme, and depending on the community's preferences, the nature of these investments range from fish ponds to developing land for rice paddies.. The focus is on helping them diversify their income generating activities so as to lessen the potential impact of losing income from fishing.



Photo 16: Livelihood Restoration Programme Downstream of the Nakai Dam, Khamkeut District

Source: Photo by NTPC Resettlement Committee

Since 2008, the fish catch of households in the 51 target villages has been recorded by the NGO, Digital Divide DATA, and the NTPC Downstream staff. The aim is to establish a long-term baseline in the target area to monitor changes in the fish catch. The water quality is also assessed by an automated water quality monitoring station downstream of the Nam Theun dam (World Bank 2010 c).

According to 'NT2 Board update 2010', the project's monitoring to date suggests that the impacts have been very limited on villages downstream of the dam wall, and that implementation of the compensation programme is complete (World Bank 2012 a).

6.2 Xe Bang Fai Downstream

Now that the turbines have been running, the Xe Bang Fai downstream is being impacted. The full nature and extent of these impacts will only become clear after several seasons. Monitoring is in place to ensure that the emerging impacts are addressed adequately.

The impacted households had the opportunity to specify their preferred options for compensation and livelihood restoration for the loss of land, fixed assets, fisheries, agriculture and livestock. The decrease in income due to flooding, the loss of riverbank gardens through soil erosion and poor water quality was compensated by asset replacement or cash, as well as by livelihood restoration measures. Moreover, the project was expected to provide on-the-job training and services which would improve the general well being and livelihoods of the affected villagers. These services include improved management of fisheries, veterinary care and agricultural extension support (NTPC 2008).

In order to implement these measures NT2 created a downstream programme which was a relatively new approach in the design of hydropower projects. The Xe Bang Fai Downstream Programme has been expanded over the years and encompassed 77 riverside villages by the end of 2010, a further 23 by the end of 2011 and the remaining 56 villages thereafter. The programme includes the following components:

- Compensation for physical cultural resources, lost riverbank gardens and resources on project lands linked to grievance procedures.
- A comprehensive livelihood programme to restore incomes adversely affected by a decline in fisheries and other unexpected impacts.
- A fish catch monitoring (FCM) programme.
- Water supply, sanitation and hygiene (WASH) component.
- Water quality, erosion monitoring and socio-economic surveys.
- Modification of irrigation pumps as required by increased flows.

6.2.1 Mid-Term Review

A joint World Bank and Asian Development Bank Mid-Term Review (MTR) of the Nam Theun 2 DSP took place in February 2011. It focused on the areas downstream of the powerhouse (largely the Xe Bang Fai), and aimed to take stock of the impacts, assess the ongoing relevance of the downstream programme, and identify mitigation, compensation and livelihood restoration activities involving people living along the Xe Bang Fai mainstream. This section starts just upstream of the junction of the Nam Gnom, which is approximately 11 km upstream of the confluence with the downstream channel, down to the Mekong River. It includes villages not located along the Xe Bang Fai mainstream but who do rely on the river

for fish or aquatic products. The MTR was undertaken in early 2011 for the following two main reasons:

- (i) Significant impacts from the project on the Xe Bang Fai area only started with the onset of commercial operations in March 2010, which provided the first opportunity to review the DSP while taking actual impacts into account.
- (ii) NTPC indicated to GoL and the IFIs that their US\$16 million budget was going to be fully utilized by late 2011 or early 2012. Currently the discussions concerning the IFIs, GoL and NTPC's future mutual obligations and budget responsibilities are still in progress.

6.2.2 Livelihood Improvement and Restoration

The livelihood programme includes the co-management of fisheries and integrated water release management. There is also a village income restoration fund (micro credit) that is available to households for such activities as the raising of cattle and forage production, aquaculture (including production of fingerlings for stocking the fish ponds of other households), and contract farming of feed corn and rice for beer. Innovative experimental work was demonstrated on household plots such as seed multiplication of rice varieties that are iron-tolerant and can be submerged as well as the delayed planting of rice after flooding. Monitoring was on going, and this included river bank erosion and the water quality (McDowell, Scudder et al. 2010p.24).

Actually the restoration of Project Affected Persons (PAPs) livelihoods' along the Xe Bang Fai is NTPC's responsibility according to the CA's "restoration of livelihoods" requirement⁸². In the end the provision of technical assistance, advice and equipment to livelihood development programmes was only carried out in 92 of the 159 project affected villages along the Xe Bang Fai and its tributaries and hinterlands. This programme has achieved considerable success as many PAPs have been able to make good use of the advice that was provided and have drawn on VIRF funds to make further progress.

Unfortunately, the decision was made to wind up this useful programme and this meant that in 67 villages the households were just given a sum of money (total of US\$945,000)⁸³ by way of compensation. NTPC did not provide the accompanying advice and assistance which have provided thus far much of the momentum to the livelihood programme in the more fortunate 92 villages (McDowell, Scudder et al. 2013 pp.15-16).

What happened in the "cash compensation" DSP villages? In 2011, there were 67 impacted villages which still had not had livelihood activities initiated in them when the quick switch was made to the cash compensation option. Around 760,000 Kip was distributed to each family and NTPC staff gave them advice on the options for the possible use of the funds. Some decided to spend it on consumer goods but other options were also taken such as the village deciding to aggregate the funds and invest in communal infrastructure such as providing everyone with an electricity supply. (McDowell, Scudder et al. 2012 p.21).

⁸²CA Schedule 4, part 4.5.1 (b)

⁸³The 67 impacted villages received cash compensation in the value of Kip 700,000 per family (around US\$88).

What did they do with the money? Based on their own decision and without being guided the villagers claimed to have invested the funds largely in livestock such as goats, chickens and cattle. They had received some help from NTPC in building and stocking a small concrete tank for raising catfish. However no school, improved access road and water supply had been provided. According to the 20th POE at least some of the households in one of the 67 villages had not wasted their cash hand out. It added that the sustainability of the villagers' long-term livelihoods remained a fundamental problem and that ambitions for improved infrastructure beyond an electricity connection have so far not been met.

Moreover, the common experience with other large dams is that cash in hand, although well used on occasions by the prudent and those with assessed business plans, tends not to be invested in productive activities but is used for consumer items and routine living expenses. Furthermore with the handing over of all the cash compensation there are no funds to transfer into a village level micro finance mechanism (VIRF). It is difficult to see how this move will help produce the CA objective of restoring livelihoods in a sustainable way. However the GoL agencies are now addressing this work, with help from IFI programmes, and will doubtlessly endeavour to maintain the momentum. Although, based on careful inventory, NTPC decided that these 67 villages would be the least affected by the NT2 project. The only way to check such a claim would be to compare the villagers' livelihoods in future socio-economic surveys in these 67 villages with those of the original 92 (McDowell, Scudder et al. 2013 p.18)

Fishing is a major source of protein and income may especially be at risk in the 67 villages. Approximately 20 of the 67 villages are close to a Xe Bang Fai tributary and hence may be adversely affected by the project (see map on page 98 of NTPC's July – September, 2012 Quarterly Progress Report).

In the CA section on loss of fish and aquatic produce (item 6.1 on page 19) there is no mention of cash compensation. Rather it states that "PAPs are entitled to participate in livelihood restoration programmes so as to ensure that their level of fish, protein and fisheries income lost, are at least restored to pre-project levels..." and "...that PAPS are entitled to receive the full benefit of the technical assistance and extension services to be provided by the company."

According to the 2012 Socio-Economic Survey, "fishing was the largest source of income for the majority of households in the study area" (page 133). Moreover as for the importance of fisheries in areas that include some of the 67 villages, it noted that between 2009 and 2012 "the greatest loss of income occurs on the lower Xe Bang Fai (riparian and hinterland households recording a reduction of approximately 50%)."

In order to address these issues the 20th POE (2/20) recommended that:

"To maintain momentum GoL ministers and the provincial governor should oversee the swift transfer of adequate budgetary resources to maintain the coordinating role of the RMU through until September 2015, and enable livelihood development services to be provided by the district agencies in the project affected downstream villages. Additionally they should also consider the possibility of providing a multi-year budget.

"The World Bank and ADB seriously consider the POE's view that more IFI assistance than is currently envisioned will be necessary if restoration is to be achieved".

"Future NTPC socio-economic surveys compare living standards between the 92 and 67 Xe Bang Fai project affected villages" (McDowell, Scudder et al. 2013 p.18).

NTPC itself and the IFIs have undertaken some very innovative work in the field. The 20th POE visited a number of projects that have been sponsored by one or another of the agencies. The research on flood tolerant rice is a recognized success; and both the banks provide support for the Xe Bang Fai District Seed Production Centre, which is to be upgraded. Another example is the incredibly impressive project sponsored fish fingerling production farm [see Photo 17]. Covering extensive aquaculture ponds it is a sophisticated operation based on NTPC's "farmers talking to farmers" programme. The entrepreneur heading it has trained 850 other farmers from 35 villages in his fingerling raising techniques and is producing nearly 1.5 million fingerlings without fully meeting the demand. A further but more modest farmer training operation is run on a small cattle farm which has training sessions for 150 farmers on raising calves using pen feeding techniques (McDowell, Scudder et al. 2013 p.22).



Photo 17: Fingerling Production Workshop Supported by the Project

6.2.3 Village Restoration Fund

An effective micro finance credit system is now recognized to be a key feature of successful village development schemes in many developing countries. The GoL has a resolved policy of having such funds available in all the villages across the country. The Village Restoration Fund (VIRF) is meeting the requirements in 92 villages in the downstream zone, where in the words of the DSP Manager, "most of the VIRF loans have been used productively".

In 2010, more than 7,000 households in the downstream villages participated in a credit based livelihood programme, with repayment levels of approximately 70% (World Bank website 2010 b).

In villages along the Xe Bang Fai some residents' paddy fields were damaged by flooding when water was discharged from NT2 during operations in 2010. Low rice harvests in the past have usually been compensated by fishing in the river, but the function of fishing activities as a conventional social safety net is gradually deteriorating as the dam's discharge damages local fisheries. NTPC offers affected communities a micro credit programme through the village restoration fund in order to compensate for the loss of fisheries. However, far from restoring their livelihoods, some households have become impoverished through debt as a result of failed businesses because they were not given adequate technical support and/or sufficient advice on business risk management (Mekong Watch 2010).

There are less commendable outcomes likely to happen. Apart from the failure of not restoring livelihoods across all the affected Xe Bang Fai zones, the project's recent success in getting an innovative village credit system up and running is jeopardized by the withdrawal of NTPC support at a critical stage in the scheme's evolution. To expect an agency without expertise or skills in the sector to take over the running of the VIRF system at this point is unrealistic. There was some intense last minute training at the time, and following on from this the VIRF was set up in 92 villages. However, overseeing the provision of capital for livelihood restoration activities has been a daunting prospect. The honest prediction was made at a recent NTPC presentation that "without external support to districts after 2012, the future of VIRF systems appears bleak". A positive move was made by the World Bank through its Khammoune Downstream Programme (KDP)⁸⁴ as it looked at ways to support VIRF sustainability "in the broader context of all government and project related village funds throughout the area" (McDowell, Scudder et al. 2012).

⁸⁴The POE recommends (10/19) that "*the World Bank through its KDP program look favourably on the proposal to support VIRF sustainability in the context of village funds throughout the Xe Bang Fai basin*".



Photo 18: VIRF Activities in the Villages

So what is to be done? NTPC and the World Bank proposed the following four options which in POE's opinion, all carry a relatively high risk factor and represent compromises:

- Option 1: To continue VIRF under Khammouane's Rural Development and Poverty Eradication Office ⁸⁵, putting stress on the capacity building of the staff in this office, at least until later in 2013 when a reassessment of progress was to be made.
- Option 2: To terminate VIRF and permit all households to withdraw their share.
- Option 3: To permit households to withdraw 80% of their share and continue VIRF with the funds from the remaining 20% of shares.
- Option 4: To maintain VIRF in the villages where it is successful and terminate it where it is not.

The 20th POE accordingly supports the GoL's decision to adopt Option 1 which involved RDPEO to assume responsibility for managing the VIRF from January 2013 and encouraging shareholders to leave their share capital available to the VIRF so that they may be able to continue to draw upon the fund for fostering livelihoods and related activities. In order for Option 1 to have a chance of working successfully several urgent steps would have to be taken, with NTPC needing to quadruple its efforts to further train RDPEO staff in the techniques of VIRF management before RDPEO takes over fully directs the VIRF (McDowell, Scudder et al. 2013 pp.20-21).

⁸⁵When it became clear that NTPC was determined to withdraw from the DSP by the end of 2012 the GoL switched from designating the Lao Women's Union as the replacement management agency, naming the Rural Development and Poverty Eradication Office (RDPEO) in its place.

6.2.4 Fish Catch Monitoring Programme

The evolving downstream programme for the Xe Bang Fai is a model for addressing downstream project affected people and their habitats. Unique for planning purposes was the commencement of fish catch monitoring before the release of turbine waters, so that the subsequent impacts on mainstream, tributary and wetland fisheries could be documented. Two pre-project socio-economic surveys, the last with a major health component, were also completed prior to the discharge of turbine waters. A detailed statistical summary of a Socio-Economic Survey was completed in September 2010 (Fredericks and Wijerathna, NTPC, September 2010) and the most recent was in the Final Report of the NTPC 2012 Socio-Economic report.

Recently, fish catch monitoring has suggested that the reduced fish catch is due to the combination of fish being harder to catch in larger amounts of rapidly flowing water, as well as a reduction in fishing efforts (Work Bank 2010 a, World Bank 2012 a).

According to the 19th POE, there has been a long term downward trend in Xe Bang Fai fish catches that predates the NT2 project. The project has undoubtedly impacted on fish catches down the Xe Bang Fai system especially in the upper middle zone. The downward trend is less marked in the tributaries than in the mainstream and in the Lower Xe Bang Fai areas. The declining trend was distorted by 2011's extraordinary floods as it made fishing conditions more difficult resulting in a decline of 25% rather than the 35% in 2010. The backwater effect from the Mekong brought bigger fish migrations than usual into the Lower Xe Bang Fai.

Therefore in order to address the issue the 19th POE (2/19) recommended that:

"The fish monitoring programme in the Xe Bang Fai zone is to be maintained through to mid-2014 in order to continue measuring catch trends and other impacts as an input into the DSP review later that year" (Mcdowell, Scudder et al. 2012 p.23).



Photo 19: Dry Season Fishing in the Xe Bang Fai, 2012

Source: NTPC, 2012

6.2.5 Water Supply, Sanitation, and Hygiene

According to the CA⁸⁶ the DSP is required to provide alternative sources of domestic water prior to the commercial operation date for villages which rely on water ways that may be affected by the operation of NT2 (Nam Kathang, Nam Gnom, Xe Bang Fai). There were 80 target villages⁸⁷, most of which are "riparian"⁸⁸ including: (i) 71 DSP riparian villages; (ii) 6 DSP hinterland villages (pilot villages), and (iii) 3 project land villages (future DSP hinterland villages).

Actually, a water supply was required in 80 villages in Gnommalat, Mahaxay, Xe Bang Fai, Nongbok and Xaibouly districts. The activities were jointly decided by villagers, relevant government agencies, and NTPC. The main activity involved the construction of deep boreholes which were 15-60 meters deep and equipped with Afri Dev hand pumps. Generally, one borehole or pump is provided for a group of 20 households in riparian villages. As of late November 2011, total of 551 boreholes⁸⁹ had been drilled out of which 480 were for DSP and 71 were drilled on the project's land in Gnommalath. Moreover, 535 hand pumps⁹⁰ had been installed (including 37 filter units) by November 2011 [see Photo 20]. Unfortunately in August 2011 there were 291 boreholes which got flooded, but these were all disinfected in September. Some of the boreholes have naturally occurring high

⁸⁶Concession Agreement Schedule 4, Part 4, Clause 6.1, Item 2 "Project Impact" - Water quality in Downstream Areas may be affected, due to the degradation of the biomass submerged in the reservoir (especially during the first few years) and increase in suspended matter.

- "Project principle of compensation": Alternative sources of domestic water of appropriate quality will be developed prior to COD. These sources will be developed for each village that relies on the affected river for more than 75% of its domestic water, and for the corresponding percentage of population if this reliance is less than 75%.

- Concession Agreement Schedule 4, Part 4, Clause 7.1, Item 6.2

"Entitled Person": Communities and households currently dependent on the Xe Bang Fai for domestic water.

"Mitigation, compensation and resettlement measure": Provision of new water supply system for:

- (a) For villages where domestic water supply dependence on the Xe Bang Fai is 50% or above, the company will provide a new water system for the entire village;
- (b) For villages where domestic water supply dependence on the Xe Bang Fai is less than 50%, provision of the new water system will be made to the corresponding percentage of the population of that village. Villages will be offered open wells or deep wells depending on technical feasibility and community preferences. Where feasible or required, a semi-reticulated system will be provided.

⁸⁷ Sourced from "NTPC's Social and Environment Unit, 2011" database.

⁸⁸ Water supply may be considered for hinterland villages as part of general compensation strategy, but is not related to CA obligation for providing domestic water supply.

⁸⁹ 551 complete as of July 2011 (121 for Gnommalath, 56 for Mahaxay, 69 for Xe Bang Fai, 114 for Nongbok and 191 for Xaibouly). So, drilling started in August 2007 completed in mid 2011 and completed 13 contracts: Thai companies, Local Lao Company and GoL- Water supply section (Provincial Nam Saat)

⁹⁰ In July 2011 the numbers stood at 116 for Gnommalath, 54 for Mahaxay, 72 for Xe Bang Fai, 103 for Nongbok and 190 for Xaibouly.

levels of iron, turbidity or salinity due to the geological conditions, and others have had occasional mechanical problems (NTPC Social and Environment Unit, 2011).

The operation and maintenance programme includes reinforcement of government counterparts' capacity and therefore 15 field training workshops were implemented to train Village Water Committee (VWC) members. These were conducted when the 83 boreholes were handed over to 15 different village authorities and had in total 216 workshop participants including 15 women. At this time all the boreholes that were planned for the riparian villages have been provided. Additionally a monitoring and maintenance system is in place in order to deal with any mechanical or water quality problems as they arise. Considering that the downstream programme staff go to most of the villages at least once a week, these issues are usually picked up quite quickly through community feedback. Where groundwater quality is an ongoing problem, new boreholes are being drilled, and where pumps are malfunctioning they are being repaired. The downstream programme team has also been testing sand filters as a way of reducing iron in the groundwater over the last year. Arrangements have also been made for the IFI team to continue monitoring this programme.

In regard to sanitation activities the programme has provided 6,575 household latrines in 75 villages, and also supported the building of 56 community toilets (with 205 stalls)[see Photo 20]. Furthermore roughly 15,000 children have received health or hygiene education in the schools (NTPC Social and Environment Unit, 2011, World Bank website 2010 b).



Photo 20: Boreholes Constructed by the Project in the Downstream Areas of the Xe Bang Fai

Source: Photo by NTPC

The DSP health statistics, which are largely matched by statistics from the plateau villages, speak for themselves:

- The child death rate in the downstream zone dropped from 120 per thousand to 76 per thousand within a four year period (2009 and 2012) .
- Where interventions took place, the prevalence of stunting among children under 5 reduced from 51.2 % in 2009 to 37% in 2012.

- The prevalence of underweight children reduced from 28.7% to 20.2% over the same period.
- The incidence of no intestinal parasitic infections rose from 51.8% to 70.3%.
- No malaria cases were detected during the two surveys partly due to a very high rate of mosquito net use.

Although there is still work to be done, especially among the under-5 age group, these are stunning figures that have been achieved over a very short time – a period of only four years. Even more stunning is the average cost of providing these health services to a village which on average is US\$600 per year. This includes in the case of a small village the salaries of a resident medical assistant and a local trained midwife. However it should be noted that this does not take into account other expenses such as a computer, transport, or specialist visits. The handover of the health programme to the Ministry of Health was delayed due to a restructuring process within the ministry. It eventually took over in March 2012 and has strongly supported the NT2 model. Hopefully Dr. Pany⁹¹ was able to remain available for the programme on a part-time basis through out 2013 as this was a welcome and sensible measure. She should also have been given the necessary resources and access to enable her to maintain an effective oversight role. Lao Lux will be involved in helping to assess the feasibility of replicating the model elsewhere in Lao PDR (McDowell, Scudder et al. 2012 pp.23-24).

6.2.6 Water Quality

The MTR's specific findings on the impacts on the water quality are described below:

- An extensive water quality monitoring programme that is in place indicates that, in general the water quality has been better than anticipated. There are two key factors that affect the water quality released from the Downstream Channel into the Xe Bang Fai. These are the water quality in the reservoir at the point of extraction to the powerhouse; and the effectiveness of the aeration structures in the Downstream Channel. Water quality data indicates that, at the intake point on the Nakai reservoir, the water quality has been better than anticipated for a new reservoir, while the downstream aeration structures improve water quality measurably. Monitoring results indicate that the water quality in the Xe Bang Fai downstream of the Downstream Channel meets national water quality standards, as well as recognized criteria for supporting aquatic life. However, it is important to acknowledge that the broader characteristics of the water in the Xe Bang Fai has been impacted by the project, most obviously in volume and flow rates, but also in temperature and colour. Villagers, for example, consistently report that the appearance of the water has changed, mainly during the dry season when the proportion of reservoir water is high.
- As previously reported, a small percentage of people directly in contact with Xe Bang Fai water developed a **skin rash**, which, while not a health risk, causes discomfort. Incidence became known and peaked in mid May 2010. In collaboration with the provincial health authorities, NTPC responded quickly which resulted in a swift decline and afterwards only a few new cases were reported in 2011. The rash has

⁹¹The health programme devised and put into operation by Dr.Surinder Kaul and Dr. Pany Sananikhom has attained icon status and is now being seen as a primary health care model for rural areas for Lao PDR as a whole and perhaps beyond its borders.

been under investigation by NTPC, local health authorities, as well as by international experts, and investigations continue. Some cases have also been discovered upstream of the Xe Bang Fai in the areas where the problem is clearly unrelated to NT2 operations (World Bank 2012 a p.22).

International Rivers in a letter to NTPC highlighted the following findings from a field visit to the Nam Theun 2 project area in September 2011, as well as from information received from villages along the Xe Bang Fai in February 2012:

"The main issue facing villagers along the Xe Bang Fai was the impacts of the serious floods that had taken place in August 2011. Other issues that arose included the water quality on the Xe Bang Fai and associated skin rashes, problems with NTPC supplied wells, reduction in the fish catch, and concerns about compensation for riverbank gardens and riverbank erosion (International Rivers website 2012)⁹².

6.2.7 Riverbank Gardens

The impacts on riverbank gardens have been consistent with predictions, with some additional impacts in tributaries due to backwater effects. The compensation process for 3,180 eligible households has been completed, and the project is now working through the grievances that have been filed (related to inclusion in the programme, amounts of compensation etc.). The extent of a reduced use of the riverbank gardens varies between households. It was also observed that some riverbank gardens have been re-established at a higher level (World Bank 2012 a p.22).

6.2.8 Handover of the Downstream Programme to the Government

The global experience related to successful restoration of livelihoods is that it requires various levels of both compensation and development, and these need to be continued in the 159 villages before NTPC hands over the management of their Xe Bang Fai DSP to GoL no later than April 2015. NTPC allocated a limited fund of US\$16 million plus a supplementary \$2.3 million for the DSP to fulfil the CA's requirement, "to at least restore livelihoods of Project Affected Persons in the downstream areas on a sustainable basis.". However due to a number of developments these amounts have not been adequate to meet the CA's requirement. .Namely there has been the decline in the value of the US\$ since the signing of the CA and also inflationary trends have translated into much less funding in terms of the Lao Kip and real purchasing power. According to NTPC's and IFI's opinion the spending of the \$16 million completes the company's obligations under the CA, even though the restoration of livelihoods of affected people has not been achieved. When the POE asked the CA's drafters for an informal assessment of this issue, they replied that legally the company's opinion probably was correct and the POE had to reluctantly accept this interpretation. Morally and ethically the company, GoL and the IFIs continue to have an obligation to see that the livelihood restoration process is completed (Mcdowell, Scudder et al. 2011).

⁹² - The full letter from International Rivers to NTPC, is available at
[http://www.internationalrivers.org/files/attached-files/ntpc_letter_feb_2012_final.pdf]

- The response from NTPC received in April 2012 is available at:
[<http://www.internationalrivers.org/resources/letter-from-international-rivers-to-nam-theun-2-power-company-february-2012-3054>]

On the part the GoL the National Assembly voted for the approval of funds in 2012 (around \$900,000) so that they are able to meet the running costs of the various Xe Bang Fai DSP in the 2012/2013 financial year. However as of March 1, 2012 they had not been released from the Ministry of Energy and Mines for the use of the Governor of Khammouane in his capacity as head of the Resettlement Committee. The gap in funding remains apparent and this can only be seen as very unfortunate, not least from the viewpoint of the people of the affected DSP villages.

To be fair to the NTPC's management and devoted staff, who have been placed in a most difficult position by individuals responsible for the project's funding, have shown considerable ingenuity in having managed to eke out the remaining funds for so long.

Finally, NTPC's response has been to opt out of providing the kind of valuable technical assistance that was given to the majority of affected people in the 92 villages and instead to provide cash compensation the remaining 67 villages in the Xe Bang Fai hinterland areas. Experience elsewhere has shown that the money is spent quickly, with not all of the recipients investing it in productive ventures.

Consequently the IFIs have become involved at this moment in time. The World Bank has agreed to fund the continuation of the training of trainers programme in the remaining villages in the interim. In collaboration with the Asian Development Bank, it has also responded generously to the situation by expanding the village level programmes along the Xe Bang Fai, which apparently covers all the downstream impacted villages. The WB has managed to do this by injecting a new element into its existing Khammouane Development Project. The combination of their useful efforts will help keep up the momentum initiated by the NTPC's programmes in the basin's villages.

7 MONITORING AND EVALUATION

Good practice requires proponents to monitor and report on the effectiveness of resettlement implementation, including the physical progress of resettlement and rehabilitation activities, the disbursement of compensation, the effectiveness of public consultation and participation activities, and the sustainability of income restoration and development efforts among affected communities. The objective of monitoring is to provide feedback on resettlement implementation and to identify problems and successes as early as possible to allow timely adjustment of implementation arrangements. This means that monitoring and evaluation activities should be adequately funded, implemented by qualified specialists, and integrated into the overall project management process (MRC-GIZ 2012 p.92).

NT2 has a robust, multi-layer monitoring and evaluation framework consisting of the following:

- **Supervision of physical implementation** of the hydropower project by professional engineering firms under contract to the NTPC and the GoL.
- **Lenders' Engineer** to monitor progress in project construction and implementation of environmental and social management plans through review of monthly and half-yearly progress reports. These are submitted by implementing agencies and through quarterly site visits.
- **Dam Safety Review Panel** to advise on technical construction, operations and dam safety issues.
- **Independent Monitoring Agencies** who report to government implementing agencies to monitor the progress on resettlement, environmental impact mitigation and watershed management issues.
- **Panel of International Environmental and Social Experts (POE)** who report to the government to advise on environmental and social issues. The POE visits Laos once or twice per year and sometimes more often depending upon the government's request. The 21 (a) and (b) POE were the most recent visits in 2013.
- **International Advisory Group (IAG)**⁹³ to advise the World Bank's president on project implementation, which covers revenue management arrangements as well as environmental and social aspects. In April 2011 IAG, undertook its tenth and final visit to NT2. World Bank management and the IAG agreed that, since the project is moving into a new phase, the tenth mission would be its last. It was decided that the social and environmental monitoring role of the IAG is to be continued by the POE.
- **Regular supervision by staff of the World Bank, other international financial institutions and bilateral agencies** in the form of site visits as well as management and technical missions.

Actually, the comprehensive environmental and social measures designed to mitigate potential environmental and social impacts could become a "global model", according to a group of social and environmental experts who advise on the project (World Bank web site 2007).

⁹³The IAG was established in 1997 and since then has visited the NT2 site regularly. It has advised the WB on project progress as well as made suggestions from which the WB can learn about its approach to hydropower.

According to the NGO International Rivers, there have been substantial shortcomings in the mitigation of impacts. According to the organization, compensation payments and replacement land for villagers affected by construction activities have been "inadequate, unfair or non-existent". Poor resettlement planning has led to housing and infrastructure delays. Plans to restore the livelihoods of villagers on the Nakai plateau and along the Xe Bang Fai have yet to be finalized. Additionally the budget for the downstream programme in particular is said to be woefully inadequate (International Rivers web site 2013).

Another approach in terms of evaluation would be to consider if NT2 is good or a bad dam? According to data in the World Bank publication "Good dams, bad dams", the ratio of the area flooded and the people resettled per MW of installed electricity generating capacity (flooded area of 41 hectares per MW and 5 people resettled per MW) is neither very high, nor very low, compared to 48 other large dams which have been analyzed. Using this specific analytical framework, NT2 could neither be considered a "good" or a "bad" dam (Ledec and Quintero 2003).

On the other hand, in 2011 a Global Energy Magazine⁹⁴ poll voted NT2 as the top hydroelectric power project of the year. The poll results were announced on the magazine's website, revealing that its readers, most of them managers from top international energy companies, voted NT2 as the number one hydroelectric power project in the 15-category renewable energy section. The selection of the award winners was based on a poll conducted through the magazine's online survey in January 2011. More than 1,100 professionals from over 700 companies spanning 73 different countries, nominated the winning projects (Times Reporter 25 July 2011).

⁹⁴The magazine is one of the leading publications in the energy industry and focuses on all areas of the business, including oil and gas, coal, nuclear power, renewable energy, power and utilities as well as transport sectors.

8 CONCLUSION

This case study is the result of a review of existing documents, surveys involving key informants and field work. Due to time and budget limitations it has been quite difficult to conduct a detailed examination of a large scale project such as NT2. Fortunately, NT2 has a good documentation system that facilitated the gathering of information from key documents, their website and various other sources. In fact NT2 conducted studies and produced several documents before carrying out the project, but there is less updated information available during its operational phase. The most recent documentation was identified as being the WB report "Nam Theun 2 board update: project progress during 2011" and the 21st (a) and (b) POE in 2013.

NT2's long history began back in 1927 and since then has entailed several difficulties throughout the consultation, planning, and construction stages. In the end full construction activities finally commenced in June 2005 and in March 2010, the project started full commercial operations, exporting 1,000 MW of electricity to Thailand and producing 75 MW for domestic consumption. NT2 is a collaboration of NTPC, GOL and 27 international banks, with a total investment of US\$1.29 billion. The NT2 revenue is used and may be used for short and long term poverty alleviation and environmental protection in Lao PDR.

Actually, due to its large size NT2 has several negative and positive impacts on the upstream and downstream areas of the dam. More than 6,300 indigenous people living on the Nakai plateau were affected as well as another 100,000 people living downstream of the project along the Xe Bang Fai and Nam Theun. These groups of people rely on these rivers for fish, drinking water and agriculture. Most of the affected people are subsistence farmers who are dependent upon natural resources for their livelihoods. The project carried out the several programmes to mitigate and compensate negative impacts caused by the project. These programmes included the resettlement of people who were living on the Nakai plateau, the payment of compensation for the assets they lost and the development their livelihoods based on project, national and international policy. Additionally this included the downstream programme which especially focused on the villages situated along the Xe Bang Fai. The implementation of those programmes followed on from the concession agreement that had been concluded between the project and the GoL.

It was noted that NT2's upstream programme had been successfully implemented, especially the resettlement programme. The project provided various infrastructure for the resettled households as well as other public services. However, livelihoods development for resettled households remains a big challenge for NT2 as well as for the first and second generation of resettled families. This will particularly be the case, when natural resources and land become increasingly limited due to for example the growth of the local population and the ending of fishing rights on the reservoir.

NT2's downstream programme and the implementation of its subcomponents remain a big issue for the project so that it can meet the CA requirements and restore livelihoods. This is due to limitations in time, budget and qualified staff, and with the hand over process to GoL already being on track. Only 92 of the 159 project affected villages along the Xe Bang Fai were given technical assistance, advice and equipment through livelihood development programmes, and then the other 67 villages received cash compensation. This action is a very critical issue for the project as purely cash compensation had not been noted as an option and also NT2's downstream mitigation measures have not been well implemented on a practical basis. Therefore, once the programmes are handed over there will still be a

number of tasks for the GoL to continue in order to support and monitor the affected people. The government could allocate some of its annual budget and staff as well as look for some international assistance to help the affected people to improve their livelihoods.

9 LESSONS LEARNED

This case study of the NT2's compensation and livelihood restoration program has identified outcomes from which the following lessons can be learned that are also useful for sustainable hydropower development in Lao PDR:

- NT2's multi-purpose development project revenues are flowing back to the people of Lao PDR and thereby improving their living conditions, such as through health care and education, as well as providing access to poor and remote areas. This is not only the case on the Nakai plateau, as since its first year of operation some of NT2's revenue has been channelled into the poverty reduction fund. This is based on the agreement that was reached between the GoL and the WB, focusing on poverty reduction in Lao PDR. An example of this mechanism at work has been the construction of more than 300 km of new and improved roads in different parts of the country, which has brought benefits to thousands of people in various provinces.
- The resettled villagers did receive permanent houses with electricity, a clean water supply and improved sanitation. However the compensation processes were too lengthy and eventually the resettlement on the Nakai plateau was completed in April 2008. Villagers were supposed to have been compensated for lost paddy fields and gardens before being resettled. Asset measurement to determine the amount of compensation affected families were entitled to was conducted back in 1998 but then they did not actually start receiving any payment until roughly October 2010.
- NT2 performed well in terms of the social compensation provided for the PAPs, who were moved from the Nakai plateau, and those living in the watershed areas and on the Xe Bang Fai. It should be noted though that the exact number may well surpass 6,300 people, as there has been a population growth rate of 3%, since base line survey was conducted.
- The project's education program has focused on both the construction of infrastructure and capacity building. Sixteen primary and sixteen nursery schools were either built or renovated. There is a primary school in each village, and two secondary schools for each village group (7 to ten villages) in the resettlement areas. As a result of these improvements the children's enrolment opportunities have been expanded. Enrolment of children aged 5 to 9 has risen to about 90% in comparison to the 31% enrolment rate in 1998. Support of the education sector is on-going, in conjunction with the district education office and the village parent student associations. However, the most important aspect now is to ensure the continuity of education for these children, as they are the second generation. One needs to guarantee that these children will not drop out of school prior to graduating and continue to study until their have finished the highest possible level of education. The family's economic situation plays a significant role in the children's education because if a family has insufficient income, the parents may ask their children to stop going to school and work to support the family instead. It has been observed in numerous dam development projects that the operators focus on the school buildings and enrolment rate rather than ensuring the continuity of children's education.
- The healthcare sector has also been improved and each village now has a healthcare service and in each village group there is a healthcare centre. This has resulted in an improvement in the health of villagers.. Although the healthcare sector's transfer period to the government took more than 2 years, it was necessary

to ensure appropriate operations after the transfer. GoL has been successfully running the centres since 2011 in aid of the resettled communities. It is a valuable lesson that other dam projects should learn from NT2's experience.

- The development of the education and healthcare sectors contribute to sustainable human development in Lao PDR. The dam operators and GoL should pay more attention to these sectors when developing the compensation programmes of future projects. In the case of NT2 it was not only the establishment of infrastructure but also ensuring that these schools and healthcare centres continue to function in order to improve the overall livelihoods of the resettled communities.
- There is uncertainty regarding the project's economic impacts, the sustainability of compensation and livelihood restoration. In NT2's socio-economic development plan it was estimated that the major income source for the resettled villagers would be from agriculture, especially commercial crops as well the rearing of livestock, wood processing and fishing. However, in reality these activities are questionable and we would like to point out the following concerns:
- There have been successful experiments in the growing of crops, especially with rice and vegetable production on the island. Other effective techniques have been applied to livestock farming such as grass production to feed the cows as well as the construction of an irrigation system for crops. However, these activities are still at the field experiment stage or are being tested at the farm level. More time is therefore needed to conduct training sessions and to promote those successful techniques among the villagers. Additionally some technical adaptations maybe necessary in different areas which have different conditions. The establishment of social frameworks may be needed in order to manage production processes and techniques as well as economic returns so as to enhance the community's capacity. Examples would be the application of simple management techniques for the irrigation system or the organization of a water user association.
- It should be highlighted that actually, the 0.6 ha of allocated land is not enough to feed a family of more than 4 people and also it is not very fertile. As an alternative, the use of the drawdown zone is still at an experimental stage. Land allocation is a major problem for almost every dam project in Lao PDR and it is the key to either the success or failure of the resettled villagers' livelihood restoration. Many of resettled people from the Nam Ngum 2 Hydropower Project (Xieng Khouang) suffer because they do not have enough land in Meuang Feung to feed their families. One woman in the new resettled village in Meaung Feung stated *"I'd prefer to go back to my former village where I didn't have a beautiful house like I do here, but I had land to produce food to feed my family"*.
- The other income generation activities on the Nakai plateau including the village forest association and fishing are still not having a considerable impact on family incomes, despite fact that the villagers received their annual dividends from the sale of wood from the association. The main reason why this has failed to deliver sufficient income for villagers is because the community has not been given their full rights regarding commercial forestry from the authorities. Furthermore, the villagers have not received any training in terms of wood processing so that they could add extra value from their wood products. Currently, each family has received a US\$100-200 dividend from selling logs. It should also be noted that this dividend varies from year to year due to illegal logging..

- Fisheries has raised another concern as the villagers still require fishing gear and the experience in fishing in a large reservoir, as most of them are not used to this practice. Therefore these villagers need more time to adapt and also the financial support to purchase the necessary fishing gear. Our study also suggests that the reservoir's fish population has seen decreasing and therefore it is necessary to establish a proper monitoring and management system for fishing to ensure sustainable fisheries for the affected people.
- In reality the main source of income at the moment appears to be from the illegal and unsustainable collection of rosewood (*Mai Ka Yung*) from the reservoir's watershed areas with fishing being the second major source of income. In the case of Namlik 1-2 dam in Meuang Feuang, it is only the members of the fishing association, who pay for a members' fee, who are able to fish in the reservoir. The majority of the members are from the better off families in the villages who also have access to the fishing gear and boats. In the meantime because of a lack of financial resources the poor are blocked from benefiting from fishing in the reservoir. Therefore the sustainable management of fishing in the reservoir and the creation of conditions where all the affected people can have equal access to the common resource are important factors to be considered by dam operators.
- There were 159 affected villages identified for the downstream programme, which had an initial budget of US\$16 million allocated for compensation and livelihood restoration. A further US\$ 2.3 million were added later as the programme's supplementary budget. However this budget was inadequate for all of the programme activities that needed to be implemented for the restoration of the affected people's livelihoods. Moreover, our study also revealed that the downstream programme had been implemented in haste and had been handed over to GoL within a relatively short period of time. Due to the speed the livelihood restoration measures for people living downstream had not been completed. Furthermore, the government had not prepared a budget for the continuation of the programme. Currently, there are 67 affected villages along the Xe Bang Fai who have only received cash compensation of USD 88 per family without further support. However, people in these affected villages still require an improvement of the village infrastructure including schools, roads and an electricity supply.
- Cash compensation may not be particularly sustainable as villagers use cash in unproductive ways or make one off payments such as for consumer goods, weddings,, funerals and other ceremonies. It is also difficult to know exactly whom to give the money" to and have the guarantee that it is used to meet household needs as opposed to those of recipient who tends to be the household head. As the compensation is signed over to the household head it is difficult for the women to influence exactly what the money is to be spent on. Similarly, funds that are given to widows and elderly couples may be expropriated by younger relatives. Furthermore there is always the risk that corruption will play a role with those responsible for making compensation payments. In the case of the Nam Mang 3 hydropower project, the resettled villagers spent the compensation that they had received for their rice paddies in various unproductive ways. Nowadays many of them do not own land either to live on or for farming and need to rent land so as to grow rice for their family.
- The development of labour skills and subsequent means of securing an access to income are particularly important for the second generation of the affected people. The objective is for a diversification of income sources and the reduction in the risk of

an uncertain income. The Village Restoration Fund which was established in 92 villages is not being effectively used by the villagers to start new income generating activities, and instead is being used for household consumption and other unsustainable one-off payments.

- NT2 is preparing to handover all resettlement programmes to GoL in 2015. It may therefore be too early to judge whether or not the compensation and livelihood restoration programme has reached the expectations of the project's socio-economic development plan or met the terms of the CA with GoL.
- In conclusion there are three important components that need to be in place to ensure that livelihood restoration activities have a significant impact on family income and also ensure the sustainability of any income improvement. Firstly the activities need to be conducted over an adequate period of time, and secondly sufficient financial support needs to be given at the same time. Thirdly there is the need for qualified agricultural officers, who are able to work closely with the villagers. There is a high risk that the livelihood restoration programme will be discontinued after the project has been transferred to GoL as it has not prepared an adequate budget and human resources. Therefore, the livelihood restoration activities and project handover should not be done hastily because these activities need time and adequate financial support so as to ensure their sustainability in the long run.

10 RECOMMENDATIONS

Based on the lessons learned and the case study's review of documents we would like to make the following recommendations regarding compensation and mitigation measures for the NT2 hydropower project's negative impacts. These are major issues for Lao PDR as it comes at a time when the number of hydropower dam projects is on the rise:

- Future dam operators as well as the authorities concerned may be able to learn from the compensation and mitigation practices from the NT2 project. NT2 was voted as the top hydroelectric power project of the year 2011 in a Global Energy Magazine poll. However, throughout the case study of NT2's good practices we have also highlighted the unsuccessful practices that should be avoided.
- Hydropower projects in Lao PDR come under various types of design concepts such as storage reservoir dams, run-of-river, trans-basin diversion, or penstock schemes. Generally though it can be said that the construction of dams causes many social, economic and environmental problems such as the displacement of populations, changes in the water flow and flooding. The effects in upstream or reservoir areas have been well studied in Lao PDR with a focus on compensation and mitigation programmes. However the downstream impacts where a larger number of people live and the impacts are much greater have often been forgotten. Looking at various examples of hydropower projects one can see this pattern, such as the Namlik 1-2 dam where no upstream villages were affected but there were more than 10 villages downstream. In the case of the Nam Mang 3 dam only 2 villages were affected upstream as opposed to more than 15 villages downstream. This difference was even more marked in the case of NT2, as there were 16-17 affected villages in the reservoir area and more than 159 villages downstream on the Xe Bang Fai that have been affected by the dam. Nowadays the dam's downstream populations are still suffering due to the compensation and mitigation programmes which were never completed. Dam developers should pay more attention to the compensation and mitigation policies as well as programmes in the downstream areas.
- The preparation of the CA may need to be more realistic in terms of a schedule for compensation, resettlement, livelihood restoration, hand over and budget to ensure the effectiveness of mitigation measures for the project's negative impacts. Unsatisfactory practices have been observed through the NT2 case study in relation to the compensation types and the downstream livelihood restoration programme. Here cash compensation was used instead of compensation in kind as was originally planned, and there was a lack of time as well as insufficient budget and staff members to support the livelihood restoration programme
- Economic activities are extremely important for a resettlement programme to successfully mitigate impacts and create sustainable livelihoods for the affected population. Our research and field visits of various hydropower dams in Lao PDR determined that the resettled villagers are still facing the problem of inadequate amounts land and agricultural techniques in order to produce enough food for their families. Before resettlement is implemented, the dam operators and GoL may need to carefully study the availability and quality of the productive land in the new living area. The majority of resettled villagers will continue their agricultural livelihoods because farming was also the main occupation before resettlement. This is where they have

experience and so they will continue to practice these agricultural techniques if the off-farm practices are uncertain and do not provide them with the means to buy food.

- GoL may need to plan in advance possible means of continuing to improve the livelihoods of the affected people after the current resettlement programme has been completed or after the handover of the programme . In the case of NT2, GoL and the local authorities can continue to help the resettlers after the handover through health and education services but as far as economic activities are concerned it is still unclear at this stage. GoL may need to allocate a budget and staff as well as look for international assistance in order to continue to support and monitor the people who have been affected by the project.

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12 APPENDIX

Appendix 1: Project Timeline

1927	Nam Theun hydropower potential described in L'Eveil Economique de l'Indochine
1989-91	World Bank feasibility study undertaken by Snowy Mountains Engineering Corporation (Australia)
1993	Lao government signs project development agreement with Nam Theun 2 Electricity Consortium (NTEC), in accordance with World Bank guidelines
1997	First series of environmental and social safeguards documents produced
1997-98	Asian Financial Crisis: Governments of Lao PDR and Thailand agree to delay the project
May 2000	EGAT and NTEC agree on a proposed electricity tariff
Sept 2001	Shareholders Agreement signed
Sept 2002	NTEC and Lao Government create Nam Theun 2 Power Company (NTPC) as a Lao enterprise
Oct 2002	Concession Agreement signed
Nov 2003	Power Purchase Agreements signed with both EGAT and EDL
2004	Completion of safeguard documents and project financing activities
2005	Financial Closure (FC) and beginning of full construction activities
Nov 2005	Nam Theun 2 Cornerstone Ceremony
2005	Construction activities commence and implementation of safeguards
April 2006	Construction of resettlement villages begins
March 2008	Concreting of the Nam Theun diversion tunnel completed
April 2008	Diversion tunnel closed: reservoir impoundment and animal rescue begins
June 2008	Resettlement completed; tunnel filling test
Aug 2008	Spillway gates closed on Nakai dam
Oct 2008	First filling of hydraulic circuit; Third Stakeholder Forum in Thakhek
Jan 2009	Water releases from Nakai dam for testing and commissioning
March 2009	Regulating dam impoundment commences; energisation of 500 kV transmission lines & substation
April 2009	Final resettlement houses all occupied
June 2009	Successful testing of first Francis Unit turbine and synchronisation with Thai national grid: first sale of energy

- Oct 2009 Entitlement houses completed
- March 2010 Commercial export of electricity to Thailand begins
- April 2010 Commercial Operation Date achieved – 25 year NTPC concession begins
- May 2010 Handover of over US\$90m of project assets to the Lao government

Appendix 2: Summary of the NT2 Resettlement Package

The following table summarizes some of the key elements of the package that were offered to the resettled villagers.

Type of Benefits	Summary of Package
Community Infrastructure	<ul style="list-style-type: none"> • All weather access roads to each village; • Meeting hall, village office, warehouse and roofed market for each village; • Primary school equipment and supplies for the classroom; • Teacher's house for each teacher's family; • Seed processing and storage facilities; • Organic fertilizer factory; • Electricity distribution system for all villages along with wiring and appropriate safety devices in each community building; • Good quality year-round domestic water supply (1 outlet per 5 households) with adequate drainage facilities; • Fish landing and trading place to allow easy boat and road access for each village.
Household Infrastructure and Assets	<ul style="list-style-type: none"> • Residential land and house with joint title to husband and wife. Household with seven or more people containing two families provided with the option to have two houses; • Flush toilet with appropriate septic tank in each household; • Standard electricity supply to each house; • 0.66ha of land for agriculture purposes, with partial irrigation; • Granary; • Specific compensation for lost paddy and fruit trees.
Livelihood Programmes	<ul style="list-style-type: none"> • An agricultural development programme, including: UXO cleared land; seeds and seedlings; fertilizer; compost bins, various agricultural tools; demonstration and extension activities; • A community forestry programme, including: a 70-year, 23,400 ha forestry concession in the areas surrounding resettlement villages, household membership in the Village Forestry Association (VFA), which can be inherited and passed on to future generations, and forestry equipment to be used by VFA (sawmills, logging trucks, carpentry tools, etc.); • A fisheries programme including: full access to fisheries in the reservoir for subsistence purposes; access to fisheries in the reservoir for commercial purposes in accordance with Reservoir Fisheries Management Programme; fisheries equipment and gear (boats, fishing nets, etc); • An off-farm marketing programme including: access to skill training for off-farm employment such as tailoring, weaving, small shops, processing of locally produced goods, marketing of locally produced goods and other services related to tourism and construction for developing unskilled and semi-skilled labour;
Transitional	<ul style="list-style-type: none"> • Monthly rice support of 18kg per adult and 12kg per child for all households

Support	<p>during the transitional period. As the majority of households have been able to access new income sources, the rice support was targeted at around 35 vulnerable households from October 2008 onwards;</p> <ul style="list-style-type: none"> • Monthly protein support of 8 eggs, 800g of dried meat and 800g of fresh meat per person, for all vulnerable households, throughout the transition period and up to the present; • Wages for clearing land and constructing houses during the transition period.
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Appendix 3: Monitoring and Oversight at NT2

Monitoring and oversight at NT2 take on three broad forms: 1) Internal monitoring, 2) External monitoring and 3) Independent monitoring. These monitoring arrangements and their outcomes play an important role through out the project's lifetime. Internal, external and independent monitoring agencies and bodies all provide important advice and recommendations to ensure that the project is well-implemented. They also help to share information publicly and transparently, in order to reach all the project stake holders. The table below provides a brief description of some of the agencies and bodies that conduct external and independent monitoring and oversight functions with responsibility for environmental and social aspects.

Agency	Task	Reporting	Frequency
International Environmental and Social Panel of Experts (POE)	Established in 1997, is mandated by the CA to provide independent review of and guidance on the treatment of environmental and social issues. It consists of 3 international experts with extensive experience in hydropower, environment, social development and resettlement.	Government of Lao PDR and Public	At least once a year
Lenders' Technical Advisors (LTA)	Reviews compliance with the CA's obligations across the construction, finance, environmental and social areas.	Project Financiers	Quarterly site visits
Independent Monitoring Agencies (IMAs)	The CA stipulates that the Government of Lao will engage IMAs to check and verify monitoring data and reports of NTPC as well as to assess the progress of implementing entities. The firm Halcrow has been engaged since 2007 as IMA for the Resettlement Management Unit.	Government of Lao PDR	Ongoing
International	Appointed by the World Bank, its responsibilities cover	World Bank President;	At least once a year

Advisory Group (IAG)	implementation of the project, including revenue management arrangements as well as environmental and social aspects. The IAG provides guidance to the World Bank on how it can improve its handling of environmental and social issues.	Public	
World Bank, ADB, and other International Financial Institutions (IFIs)	Conducted in the form of site visits and management missions and covers all aspects of project implementation – focused both on ensuring compliance, and on providing technical advice. Both the World Bank and ADB have staff in Vientiane as well as in other places. These staff members closely monitor developments, report the wider team, and help to “trouble shoot” challenges as they emerge.	World Bank, ADB, and IFIs	Ongoing- usually a member of the World Bank or ADB team visits Nakai every week or so

MRC-GIZ COOPERATION PROGRAMME BACKGROUND

GIZ is supporting the Mekong River Commission (MRC) in its work in poverty-alleviating and environmentally friendly development of hydropower, as well as in protecting the population from the negative impacts of climate change in the Lower Mekong Basin. GIZ is directly supporting experts and managers from the MRC Secretariat, the National Mekong Committees and the ministries for water, energy and environment in the member countries. The GIZ programme aims to achieve long-term, sustainable improvement to the life situations of the more than 60 million people in the Lower Mekong Basin.

The GIZ programme comprises the following components

(<http://www.giz.de/themen/en/30306.htm>):

- Supporting the Mekong River Commission in organisational reform
- Supporting the MRC in pro-poor sustainable hydropower development
- Supporting the MRC in Adaptation to Climate Change in the Mekong region
- Adaptation to climate change through climate-sensitive flood management

Supporting the MRC in pro-poor sustainable hydropower development

GIZ is advising the Mekong River Commission (MRC) on developing and implementing instruments for testing and improving the sustainability of hydropower projects. This includes for example instruments for analysing the impacts of hydropower development in catchment areas as well as approaches for establishing benefit-sharing mechanisms within water catchment areas and beyond borders. In addition, GIZ is promoting the exchange of experiences between various river basin commissions involved in sustainable hydropower development. The project is also developing basic and advanced training measures on sustainable hydropower.

Network on Sustainable Hydropower Development in the Mekong Countries (NSHD-M)

The NSHD-M is integrated in the project 'supporting the MRC in pro-poor sustainable hydropower development' of the Mekong River Commission (MRC) - GIZ Co-operation programme. The Network was established in October 2012 by universities and research institutions in the Mekong countries Cambodia, China, Laos, Thailand and Vietnam. The network aims to

- enhance knowledge and skills on sustainable hydropower development (SHD) at academic and research institutions,
- share knowledge and experiences on SHD in the Mekong countries,
- increase awareness on SHD at all levels of decision making,
- strengthen the capacity of stakeholders, including planners and decision makers, to cope with the challenges of SHD.

The network and its activities in the Mekong River Basin are supported by GIZ on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ).

Further information on NSHD-M goals, activities and partners:

www.cdri.org.kh/index.php/nshdmekong.

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