

NAM THEUN 2 WATERSHED MANAGEMENT AND PROTECTION AUTHORITY

**SOCIAL AND ENVIRONMENT MANAGEMENT
FRAMEWORK AND OPERATIONAL PLAN (SEMFOP-1)**

[1st April 2005 to 30th September 2011]

PART 1:

SEMFOP OBJECTIVES AND PRINCIPLES

(JANUARY 2005)

TABLE OF CONTENTS

1.1: BACKGROUND	1
1.2: PURPOSE OF THE SEMFOP	1
1.2.1: <i>Key Objectives</i>	1
1.2.2: <i>Aims of the SEMFOP document</i>	2
1.3: SEMFOP STRATEGY	3
1.3.1: <i>Fundamental Principles of the Strategy</i>	5
1.4: OPERATIONAL AREA COVERED BY THE SEMFOP	6
1.4.1: <i>The NT2 Watershed</i>	6
1.4.2: <i>Peripheral Impact Zones</i>	10
1.4.3: <i>The NT2 Reservoir</i>	12
1.4.4: <i>Nam Chat–Nam Phan Provincial Protected Area</i>	13

1.1: BACKGROUND

The planned Nam Theun 2 Hydropower Project (NT2) involves the impoundment of the Nam Theun near Ban Sop Hia and the creation of a reservoir which, at full supply level, will flood an area of 450 km². Of this area approximately 130 km² was inside the original Nakai Nam Theun National Protected Area (NNT NPA) as designated by Government of Lao in 1993. The boundary of the NPA was modified in 2000 by Decree 193 to excise the flooded area out of the NPA. At the same time, the NPA is experiencing a range of development pressures ranging from unsustainable wildlife hunting to illegal logging to habitat conversion which undermines the long term viability of this ecologically significant area.

This confluence of scenarios – a progressively degrading watershed and a small area of this NPA being impacted by the NT2 Project flooding - led the NT2 project principles (GoL, WB and NTEC) to the logical conclusion and agreement that that the NT2 Hydropower Project would pay for the management of the Nam Theun watershed (including the NNT NPA and expanded to include two corridors zones) as both (a) mitigation for the loss of the 3.6 % of the NPA to flooding, and (b) for the long term sustainable management of its catchment, based on the ‘user pays principle’.

The SEMFOP programs are designed as an offset of all known, unknown or potentially unmitigated biodiversity impacts resulting from the Nam Theun 2 Hydropower project. The priority objective of SEMFOP therefore is the long term protection and conservation of the NNT NPA. The level of funding and time period of assured financial support from the project is unprecedented in Lao conservation. Without this funding the NPA would have no future as an intact Protected Area.

1.2: PURPOSE OF THE SEMFOP

The purpose of the Social and Environmental Management Framework and Operational Plan (SEMFOP) is to ensure the effective, long-term protection of the biodiversity and watershed values of the Nam Theun 2 catchment while at the same time safeguarding the well-being, traditional livelihoods and culture of its human inhabitants. This SEMFOP document describes the baseline setting, institutional arrangements, management planning, program activities and budget framework for the first 7 years of operation of the Nam Theun 2 Watershed Management and Protection Authority (WMPA).

1.2.1: Key Objectives

SEMFOP aims at the progressive achievement of the 5 main Objectives of the WMPA as specified in Article 4 of Decree 25.

1.2.1.1: Protection and Rehabilitation of Forest Cover

Regarding objective 1 – “the protection and rehabilitation of forest cover in the NT2 Watershed/NPA to assure adequate water flows with low sedimentation to the Nam Theun 2 Reservoir” - the 1st SEMFOP will focus on forest protection as a first step, while rehabilitation will be included as a focus in future versions of SEMFOP.

1.2.1.2: Biodiversity Conservation, National Park Development, Tourism and Research

Regarding objective 2 - “Conservation, maintenance and promotion of biological diversity coupled with the development of culturally-rich, national park appropriate for tourism and scientific research”- SEMFOP-1 will certainly focus on biodiversity conservation and promotion, but the development of the area as a national park for tourism will likely be a focus only after the unsettled period of reservoir construction and associated activities. National park development will also recognise and cater for the the livelihood needs and rights of the NPA communities. Scientific research will be initiated during SEMFOP-1, but not at the level envisaged for the reservoir area (under the EAMP but through the WMPA). Research will likely play a larger role in

SEMFOP-2 and after. The WMPA will invite international research institutions as partners and funding agencies to work within its framework from the start of SEMFOP-1.

1.2.1.3: Strengthening the Capacity of the WMPA and Stakeholders

Regarding objective 3 - “Building and strengthening capacity of the Authority and those Stakeholders contributing to management and implementation of the Authority’s activities” – establishing the WMPA and strengthening staff capacity to effectively protect and manage the NPA will receive emphasis in the early years of SEMFOP-1. However, it is envisaged that later SEMFOP’s may see a relative reduction in the institutional and staffing size of the WMPA and a greater role for district and provincial authorities, once capacity in this regard has been strengthened through their hands-on, partnership experience with the WMPA.

1.2.1.4: Livelihood Improvement, Poverty Reduction and Sustainable Development

Regarding objective 4 - “Facilitation of improved livelihoods for inhabitants of the NT2 Watershed-NPA by focussing on poverty reduction through environmentally sustainable development” – will be a focus throughout the life of the WMPA, including this SEMFOP-1. However, such improvements in livelihoods must be undertaken within the framework of integrated conservation and development, and participatory NPA management.

1.2.1.5: Prudent Management and Effective Use of Funds

Regarding objective 5 - “Prudent management and effective use of funds for the purpose of furthering the above objectives” - will also be a focus throughout the life of the WMPA, including SEMFOP-1. While the actual management procedures may change and improve throughout the life of the WMPA, those proposed to be employed during SEMFOP-1 are detailed in Section 7.11.

The implementation of SEMFOP, if successful, would assure the long term protection and management of the Nakai Nam Theun National Protected Area (NNT-NPA): an NPA of national and international importance. The Nakai-Nam Theun NPA is not only the largest of Lao PDR's twenty national protected areas, it is without doubt the most important for biodiversity conservation. It is widely regarded as one of the most important protected areas in Asia.

1.2.2: Aims of the SEMFOP document

The specific objectives of this SEMFOP document are:

1. To consolidate, integrate and update all previous and the currently available documentation concerning the (planned) social and environment management plan for the NT2 WMPA’s Watershed/NPA;
2. To provide a single folio that presents the setting and challenges for biodiversity conservation and sustainable development, institutional arrangements, management framework and strategy, an operational plan and a budget for the management and protection of the NT2 Watershed/NPA;
3. To present baseline data and maps aimed at providing a better understanding of the value of the NT2 Watershed/NPA;
4. To address relevant safeguards policies, especially those concerning Ethnic Minorities and Resource Access Restriction, in order to satisfy the safeguards policy requirements of supporting financial institutions; and

¹ The area of the NT2 Watershed/NPA is 4,240 km², fractionally larger than the current area of the Nam Et Phou Loei NPA which is 4,230 km².

5. To provide an management framework and a detailed operational plan for the operation of the NT2 WMPA for its first 6 years. The framework and plan should ensure the long term sustainable management of the area.

1.3: SEMFOP STRATEGY

SEMFOP's overall strategy is to create an effective watershed management authority that can work effectively with local communities to implement a range of programs to protect the watershed. SEMFOP is built upon three core programs: Forest and Land Use Planning, Allocation and Management at the village and NPA levels; Biodiversity Resource Survey, Monitoring, Research and Protection; and Village Livelihood and Social Development. In addition to these core programs, SEMFOP considers at least three other functions, as important in achieving the goals of SEMFOP: Community Outreach and Conservation Awareness; Reservoir Management and Development; Tourism.

The identification of the functions and tasks of the SEMFOP required to achieve the WMPA's goals is based on a balanced, integrated approach to Protected Area management which is becoming accepted as appropriate in most Protected Areas of the Lao PDR. This approach focuses on the need to find a balance between regulation enforcement and community participation, between sustainable forest and land use planning and conservation and village development, and of building partnerships between local stakeholders in the management of Protected Areas.

The main elements of the development strategy to be applied in the SEMFOP-1 are²:

- seek to steadily improve food security for NPA and PIZ villagers;
- recognize customary rights by providing villages with usufruct rights of their areas and improve the management of natural resources through realistic and effective land and forest use planning and management;
- foster the diversification of livelihoods and land use patterns towards more sustainable livelihood and farming systems according to villager needs and aspirations;
- avoid development of inappropriate infrastructure such as vehicular roads, electrification networks, and the like;
- develop and support appropriate, water based access into and out of the NPA, and good track access between key village in he NPA; and
- maintain current population levels, or less, by family planning, the control of in-migration and facilitating out migration through upgrading villager capacity;
- improve health and education levels, and village institutions in line with their cultural and ethnic heritage and identify.

Thus, the emphasis will be on development resulting in self sufficiency in rice, and not on promoting cash crops as an alternative to shifting cultivation.³ As elsewhere, all opportunities to open up new paddy fields, or provide supplementary or dry season irrigation to current fields, will be explored and developed where feasible and environmentally appropriate.

In addition, any opportunities to improve and/or modify the current systems of swidden farming – the basis of NPA village rainfed cropping systems – will be identified, tested and/or developed in accordance with the

² See EMDP, part 3, section 7.1

³ currently, the cost of rice in the NT2 watershed-NPA is 4,000 kip per kg, compared to about 2,000 kip/kg on the Nakai plateau and 1,000 kip per kg in the lowlands of the Lao PDR.

wishes of villagers. These may include improved fallows, development of permanent terraces with manure or fodder producing hedgerows, permanent agroforests, and improved integration of grazing and cropping.

The emphasis will not be on shifting cultivation eradication, but the stabilisation of shifting cultivation by the gradual improvement and management of fallow swidden system, with the ultimate goal of avoiding soil erosion (by either long cycles or improved fallows) and absolutely no swiddening of primary forests.

The joint development with villagers of improved practices will require training, study tours and the establishment of participatory on-farm trials. A long term timeframe will be required for this, especially in the NPA villages where the option of cash crops is not realistic.

Another aspect of the development strategy (as outlined in the EMDP) is to take villagers current practices as the starting point and seek to foster gradual improvements, improvements appropriate to the fact that the villagers are within a national Protected Area and the watershed of a major hydropower project, providing essential funds for the governance of the Lao PDR and for the electrification of significant portion of the country as a whole. This analytical approach is summarized in Table 1.1 below.

Table 1.1: Potential to develop alternative/improved practices evolving from current livelihoods.

CURRENT PRACTICES	ALTERNATIVE, IMPROVED PRACTICES
Rice produced by swiddening, or shifting cultivation	<ul style="list-style-type: none"> ▪ Improved or managed fallows ▪ Development of sustainable agro-forestry systems ▪ Seek to open supplementary irrigated paddy fields
Rice from rainfed or supplementary irrigated paddy fields in the wet season	<ul style="list-style-type: none"> ▪ Improve current irrigation systems, ▪ Make temporary irrigation systems permanent ▪ Open new paddy land and irrigation systems ▪ Improve draft power availability
Foraging for non-timber forest products for sale	<ul style="list-style-type: none"> ▪ Improved tenureship of forest areas, and management of NTFPs and their harvest ▪ Semi-domestication of selected NTFPs in Home gardens, swidden fallows and agroforest
Unrewarding and unleveraged sales of NTFPs to itinerant traders at low prices	<ul style="list-style-type: none"> ▪ Organised group marketing of NTFP ▪ Value-added local processing.
Hunting protected wildlife for dietary protein and cash income	<ul style="list-style-type: none"> ▪ Managed wildlife offtake for consumption only. ▪ Semi-intensive production of domestic livestock (vaccination, managed forest or feeds etc.)
Extensive free-range herding of low-quality, disease prone livestock on fire-induced grassland	<ul style="list-style-type: none"> ▪ Improved pastures ▪ Hedgerow contour planting of forage species ▪ Legume pastures undersown into upland rice
Use of child labour for hunting, gathering and swidden farming.	<ul style="list-style-type: none"> ▪ Sustainable and productive agricultural lifestyles which allow children to be educated, thus opening opportunities for off-farm employment ▪ Ensure children participate in the improved education opportunities.

Successful implementation of the SEMFOP programs will require staff, equipment, and financial resources. SEMFOP's approach includes support for staff capacity building, infrastructure, equipment, and technical assistance.

It should be noted that no land acquisition is anticipated under the SEMFOP for development or infrastructure purposes. However, if this should be necessary at a future date, the IFIs will first be consulted, and a resettlement plan will be prepared in accordance with their safeguard policies. This condition also pertains to any voluntary contributions of any land.

1.3.1: Fundamental Principles of the Strategy

Experience with Protected Area management and rural development in the Lao PDR, and the region, suggest that at least three major principles should guide the development of the strategic approach to the management of the WMPA and operational plan of this SEMFOP-1.

There are 3 main components of Protected Area management, which must be fully integrated under a Participatory Integrated and Development (PICAD) ⁴ approach:

- Forest and Land Use Planning, Allocation and Management (FLUPAM)
- Biodiversity Monitoring, Management and Protection (BMMP)
- Village Livelihood and Community Development (VL/CD)

Under SEMFOP this integration of components will be achieved by:

- stakeholder participation – the participatory approach to protected area management;
- development and implementation of formal instruments such as agreements, contracts and regulation;
- implementation of both conservation and development by the same institution and staff, thus fostering informal and contextual linkages between the components.

Management of an NPA based on all these principles can certainly be effective, but only if the parallel conservation and development functions are clearly presented in activity plans and the linkages between them explicitly understood and incorporated in the programs.

A brief review of these functions is presented in the following.

1.3.1.1: Forest and Land use Planning, Allocation and Management Program

Forest and land use planning and allocation activities in villages in or around the Protected Area focus on villager-forest interactions, on the identification of use, management and conservation zones, and of land suitable for agricultural development. Objectives of this task include:

- i) providing the basis on which sustainable agriculture and agro-forestry development activities can be planned and implemented,
- ii) the development of sustainable management and use of forest resources, incl. NTFPs,
- iii) the encouragement of villager participation in (agreed rights with responsibilities) the management of that section of the NT2 Watershed/NPA that is under village control.

1.3.1.2: Participatory Protected Area Management Program

This program includes biodiversity and ecological surveys and research which must also be undertaken over time to assess the status of the biodiversity, the effect of management on this status and identification of specific ecological niches or biotic interactions which should be considered to improve conservation management zonation and regulations. Especially important is patrolling and the enforcement of regulations developed to protect and conserve the floral and faunal life of the NT2 Watershed-NPA.

Community Outreach and Conservation Awareness

This task is a two way process. It requires the identification of any local concepts or practices of conservation and sustainable resource use, and then to present the rationale and basic aims of conservation to the populace

in a way that can be understood and digested by remote ethnic villagers who have lived there entire lives within the natural system which is now incorporated into an NPA.

1.3.1.3: Livelihood Development for Conservation Program

Livelihood development aims to assist villagers to develop sustainable agricultural and agroforestry production systems which will limit or contain degradation of the biodiversity and natural resources - the primary function of the NT2 Watershed-NPA. The overall aim is more productive farming systems. The focus on livelihood development gives recognition to the fact that villagers may need to modify their previously unrestricted use of natural resources in order to achieve NT2 Watershed-NPA management and biodiversity goals. Development assistance in exchange for help with protection is thus both a demonstration of goodwill and concern by the agency supporting livelihood changes and aims to provide villagers with the necessary means by which they can effect such behaviour changes.

Social development seeks to improve health, education and other social facilities, with the aim of not only reducing mortality, alleviating poverty and improving literacy, but also providing a foundation on which villagers can participate in the long term development process. Essential to these tasks is the training and strengthening of community institutions to manage this development process, which may include village development committees, or their ethnic/cultural equivalent.

Eco-tourism

As in many Protected Area of the Lao PDR, there is considerable potential for tourism based on the natural and cultural features. However, this potential still remains just that - unrealised potential - mainly due to lack of infrastructure (roads, accommodation, access etc.). The implementation of the NT2 project may overcome some of these constraints (improved roads and funds for other infrastructure), and will also result in an impressive, if not complex reservoir which may provide significant tourism potential. The SEMFOP aims to improve (limited) access into the NT2 Watershed/NPA under the management of WMPA which intends to begin tourism development by designing with villagers a community-based nature tourism program targeting the predominant, low-budget tourists found in the Lao PDR. No decisions will be taken on large-scale, up-market tourism development until adequate lessons have been learned from the community based program.

1.4: OPERATIONAL AREA COVERED BY THE SEMFOP

The geographical coverage and operational area of the SEMFOP includes:

- i. The NT2 Watershed: the area of legal authority of the WMPA as defined in Prime Ministerial Decrees 25 and 193; and
- ii. Peripheral impact zones (PIZ)⁵: areas around the NT2 Watershed inhabited by villagers who enter, or use resources of, the NT2 Watershed and thus have an impact on the NT2 Watershed.

1.4.1: The NT2 Watershed

1.4.1.1: Definition and Location

The area in which the WMPA is mandated to operate is legally defined by PM Decree 25 (on the establishment and activities of the NT2 Watershed Management and Protection Authority). Decree 25 defines the NT2 Watershed as

⁵ Although the NT2 reservoir will be managed by another, as yet undefined authority(s), and is therefore not included in the operational area of the WMPA, it borders directly with the NPA and will therefore be considered as part of the peripheral impact zone. Inclusion of the PIZ, in addition to the legally defined NT2 Watershed, is considered necessary to achieve, and be consistent with the objectives of the WMPA. Notwithstanding this, the NT2 Watershed/NPA will, of course, remain the first priority of the SEMFOP.

"the area including the Nakai Nam Theun NPA, the southern corridor and the Nam Theun corridor, as set out in Decree no. 193/PM dated 29 December 2000."⁶

Thus, the legal definition of the NT2 Watershed encompasses;

- (i) the Nakai Nam Theun (NNT) NPA;
- (ii) the NNT - Phou Hin Poun NPA corridor; and
- (iii) the NNT - Hin Nam Nor NPA corridor,

Map 1B indicates the location of these three components of the "NT2 Watershed" while Table 1.2 shows their respective areas.

Table 1.2: Areas of the three protected areas which form the legally defined NT2 watershed.

Protected Area	Total Area (km ²)
Nakai Nam Theun (NNT) NPA	3,439
NNT-Phou Hin Poun NPA corridor	513
NNT-Hin Nam Nor NPA corridor	36
Total	3,988

Map 1B in the Annexes also indicates the actual physical 'catchment' of the NT2 dam and outlet. The legal definition of the 'NT2 Watershed' area:

1. does not include some areas physically in the catchment, especially the reservoir and its southern slopes which will be the focal area for resettlement;
2. does include NPA areas outside the physical catchment but which are contiguous and important in terms of habitats, forests and wildlife movement

1.4.1.2: Administrative Boundaries in the NT2 Watershed/NPA

Maps 4 and 5 in the Annexes show the current administrative boundaries in the NT2 Watershed/NPA, and the area of each District in the NT2 Watershed/NPA is indicated in Table 2.9.

Table 1.3: Analysis of administrative (district) areas in the NT2 Watershed/NPA

District	Total Area of District	Area of District in NT2 Watershed/NPA	Percentage of District	District Percentage of NT2 Watershed/NPA
Nakai District	4,295 km ²	3,169 km ²	73.8 %	80 %
Khamkerd	4,396 km ²	592 km ²	13.5 %	15 %
Gnommalat	1,571 km ²	131 km ²	8.3 %	3.3 %
Boualapha	3,293 km ²	66 km ²	2 %	1.7 %
Total		3,958 km ²		100 %

1.4.1.3: Southern Boundary of NT2 Watershed/NPA

The southern boundary of the Nakai Nam Theun NPA, and thus the NT2 Watershed-NPA has been an unresolved issue for some considerable time. According to PM Decree 164 (1964) the NPA takes the Nam Theun river course as its southern boundary – due partly to the fact that this river course is clearly definable on a map and on the ground, and that most agricultural fields on the plateau lay to the south of this river. PM

⁶ The technical definition of a watershed or catchment is 'all that area above a certain point, which collects those rainwater's which eventually flow to the point of concern' differs from the definition used under the WMPA Decree.

Decree 193 defines the new boundary as the high water line of the NT2 reservoir. Although the precise delineation of this will not be clear until reservoir filling, Decree 193 states that the final NPA/reservoir boundary will be confirmed by ground inspection by MAF, the WMPA, local authorities and NTPC once reservoir inundation occurs.⁷

The WMPA proposed various options for the exact delineation of this boundary as shown in Table 1.4. Option 4 represented the most practical solution in regard to the southern boundary and was favoured by the WMPA from a conservation perspective. This issue has now been resolved and option 2, the northern shore of the reservoir (at maximum capacity of 538 masl) as the southern boundary of NPA has been agreed to.

Table 1.4: Options for defining the southern border of the reservoir

Options	Pros and cons
1. Designating the whole reservoir (up to 538 masl) as a mandated, legal component NT2 Watershed/NPA	Provides WMPA full authority to ensure adequate conservation measures are taken. May impose unworkable restrictions on other stakeholders.
2. Designating the northern shore of the reservoir (at maximum capacity of 538 masl) as the southern boundary of NPA – essentially excising the entire reservoir from the NPA.	Tractable and simple and will better accommodate the needs of other stakeholders. This will leave a tract of land between the reservoir and the NPA during draw down each year, where activities detrimental to conservation could occur.
3. Designating the northern shore of the reservoir (at maximum drawdown of 525 masl) as the southern boundary of NPA.	Avoids the no-mans-land problem in ‘2’ above. Difficult to identify and mark the boundary except at maximum drawdown.
4. Designating the boundary as a gently curving line generally following the reservoir northern shore, but leaving all significant inlets, coves and creeks within the NPA.	Easy to patrol (by boat) and demarcate (signs at the mouths of the inlets, and accommodates other stakeholder needs over most of the reservoir
5. Designating the boundary as the navigation channel to run east-west through the reservoir.	Simple, tractable and easy to patrol and demarcate. May infringe on other stakeholders’ uses.

In order to retain some of the advantages of option 4, it has been proposed that the WMPA enter into a some form of co-management agreement with the NTPC for the draw-down reservoir area including, water bodies in any major inlets close to the NPA. Although the co-management agreement could and should be enshrined in the revised Decree 25, this should be phrased in wide-ranging terms and the details worked out by the Reservoir Management Authority at a later date. This latter authority (See Section 1.4.3) represents the interests of all stakeholders and is the only body capable of making co-management decisions in regard to the area in question.

1.4.1.4: Adequacy of the NT2 Project Offset

The rationale of the Concession Agreement is that improved protection of the NT2 Watershed/NPA made possible by the provision funding to the WMPA for PA management provides adequate compensation for the loss and/or degradation of habitats as part of the project.

A Natural Habitats Accounting conducted in 2003 by Malaysian Environmental Consultants (MEC, 2003) estimated that approximately 12,500 ha⁸ or 3.5 percent of the original NNT NPA was lost by the boundary changes created by PM Decree 193. As shown in Table 1.5, the combined total of lower value habitats (agriculture, and unstocked forest) account for over one third of land lost. The mixed broadleaf/coniferous

⁷ MAF Order 120. MAF confirmation as to the matter referred to for the Nam Theun 2 Hydro Power Project. 2nd July, 2003.

⁸ This does not include habitat conversion or degradation in the corridor zones caused by road and dam construction.

habitat suffers the largest total loss, but on a percentage basis this only accounts for a little over 10% that habitat type. The other higher value habitats (evergreen and mixed deciduous) together account for only about 5% of the area lost. Consequently, relative to the entire NPA, habitat loss is small and of comparatively low value.

Table 1.5: Habitat type areas affected by the Nakai Nam Theun NPA boundary changes (ha).

Habitat type	Area of NPA lost	New NPA area	Original NPA area	Percentage loss (%)
Upper dry evergreen	64	189,219	189,283	0.03
Upper mixed deciduous	2,248	48,513	50,761	4.43
Coniferous forest	18	934	952	1.87
Mixed broadleaf/coniferous	7,012	51,261	58,274	12.03
Bamboo	0	45	45	0.00
Unstocked forest	2,588	41,737	44,324	5.84
Ray	194	2,124	2,318	8.36
Scrub	0	2,076	2,076	0.00
Rice paddy	0	1,507	1,507	0.00
Other agriculture	294	1,052	1,346	21.82
Swamp	43	181	224	19.10
Village homestead area	0	63	63	0.00
Total	12,459	338,714	351,173	3.55%

ADB Policy on Compensatory Forestry

ADB policy on compensatory forestry states that the Bank will not finance any rural infrastructure or other public investment project that contributes significantly, directly or indirectly, to deforestation or to the degradation and depletion of forests. Should any such deforestation or degradation become inevitable, the Bank will insist upon a compensatory mechanism to reforest or rehabilitate equivalent areas as appropriate in full consultation with affected communities (ADB Policy on Forestry, March 1995). The NT2 Project has triggered this policy due to the loss of forest caused by reservoir inundation, dam construction and other project works. Forest loss due to these causes is estimated at 28,760ha which must be compensated for under the policy.

In addition to the off-set to be provided by protection and conservation of the Watershed, the Project will undertake activities to rehabilitate and/or reforest degraded forest areas currently having less than 20% crown cover. As shown in Table 1.5, there are 41,737 ha of unstocked forest within the NPA which could potentially be reforested to meet the ADB's compensatory forest requirements.

The FLUPAM process allows, and indeed encourages communities to delineate areas of land for forest regeneration and sustainable management. Such areas could thus count towards fulfilling ADB's compensatory forestry requirements. Natural regeneration in these areas could be achieved through a non-incremental and/or minimal cost suite of activities, while enrichment planting in agreed areas could be financed under the LDC. The FLUPAM process, described in Section 2.2, endeavours to identify such degraded forest areas, and jointly with villagers, plans appropriate interventions to promote forest regeneration through sustainable management agreements. Mechanisms to assess the area of land identified for compensatory forest and systems to monitor their effective regeneration will be integrated into the FLUPAM process and the overall SEMFOP monitoring framework under the certification standards of forest management (Section 6.5.1.2). An initial assessment of the potential for compensatory forest in some of the most promising areas is summarised in Table 1.6. As these activities are included within the existing FLUPAM process, the budget will come from the established FLUPAM implementation budget lines.

Table 1.6: Summary of potential areas for compensatory forestry.

	Location	Area	HH	Potential
1	Along Route 8	1,640	129	High - no swidden, villagers have paddy, low population pressure
2	Nameuang & Nasao villages	790	39	High – villagers have paddy, low pop pressure, fast regeneration
3	Nam Hoy village	1,580	434	Low – high population pressure, slow regeneration, some swidden
4	Phouphon village	1,650	74	Med – low population pressure, mainly swidden, easy access
5	Thameuang village	3,978	145	Med - low pop pressure, villagers have paddy, high grazing demand
6	Fangdeng village	2,730	183	Low - high pop pressure, mainly swidden, increasing population
7	Makfeuung village	10,995	377	Med – low pop pressure, high swidden need, very little paddy
8	Nam Noy watershed	9,664	429	High – low population pressure, mainly swidden, fast regeneration
9	Ka Oy resettlement village	694	0	High – zero population pressure, village to be resettled

In the event that it is found that the full area of required compensatory forest cannot be identified within the NNT NPA, it has been estimated that 500-5000 ha is available in the resettlement area. In this area, FLUPAM will also be used to identify areas of degraded forest for regeneration to support village livelihood needs, and for management under the community forestry program to be implemented in the resettlement area.

1.4.2: The Peripheral Impact Zone

The NT2 Watershed/NPA has a moderately small population, yet it is surrounded by a large and expanding population undergoing rapid, and in places unsustainable, development. Villagers from these Peripheral Impact Zones (PIZ) adjacent to the watershed are having a large impact on it, and may have an increasingly large influence on the sustainability of the NPA if not managed effectively. Thus, the area surrounding the NT2 Watershed/NPA is included as an integral part of the Operational Plan of the SEMFOP, as provided for under Decree 25.

Unlike the NT2 Watershed/NPA, which has legally defined geographical boundaries, it is difficult to define exactly the geographical or administrative limits of the PIZ. Peripheral Impact Zones (PIZ) are usually defined on a case by case basis, hence in the current context, they are defined as those areas and villages (in the Lao PDR) adjacent to but outside the NPA which harbour humans who enter, or would like to enter, the NPA for the purposes of resource extraction, land cultivation or similar potentially destructive activities. PIZ status is delineated and restricted to those villages who would benefit directly from the long term protection of the NPA through sustainable harvest of NTFPs, the maintenance of watershed values, employment opportunities, and general quality of life issues. The PIZ is thus delineated and limited to those villages that would benefit in this way through active engagement in conservation.

The foregoing definition excludes trans-border encroachers, illegal logging concerns, poaching gangs, would-be concession holders or other individuals/entities who operate from more distant locations but enter and destructively use NPA resources. The difference here is that these groups are entirely exploitive and have no vested interest in maintaining biodiversity values and watershed functions to sustain their livelihoods over the long term, and are thus not likely to be influenced by active engagement.

SEMFOP strategy in regard to this latter exploitative group focuses on improved control and enforcement to keep them out of the NPA and to stop their illegal activities. On the other hand, a partnership approach will be adopted with PIZ villagers through active engagement on awareness raising and alternative livelihood support to reduce their reliance on the NPA and to promote them as protected area ‘gatekeepers’. The

ultimate aim is to instil a sense of ownership and establish a network of stakeholder communities forming a buffer around the NPA. The details of this strategy are presented in Section 2.7 of this document.

1.4.2.1: Stakeholder Villages

An initial criterion to be used to determine a village's role in NPA management and the level and type of support it will receive is its location in relation to the NPA. Four general types of villages can be defined, one within the NPA and three in the PIZ. These are described in more detail in Section 2.7 and are summarised here as follows:

Type 1: Villages located totally within the protected area and corridors (NPA villages).

Type 2: Villages whose 'boundaries' overlap those of the protected area (PIZ villages).

Type 3: Villages adjacent to the protected area (PIZ villages).

Type 4: Villages distant from, but 'using' the protected area (PIZ villages).

Analysis of village type enables a process of prioritisation and level of support. In general, type 1 villages will rate as highest priority and receive high levels of support, while PIZ villages (types 2-4) will normally receive support consistent with their level and type of reliance on the NPA. It should be emphasised that all communities that will be affected by resource access restrictions will be covered by the Process Framework and are entitled to compensation in the form of livelihood development support, however, entitlements will be based on location and customary rights.

On the basis of the foregoing, some communities in the districts of Khamkeut, in Bolikhamxai Province, and Gnomalart and Nakai and Boulapha, in Khammoune Province, are considered part of the PIZ, and the WMPA will actively engage and work in partnership with these district authorities. The number and type of the potential PIZ villages is shown in Table 1.7.

Table 1.7: Numbers and location of PIZ villages

Province	District	Number of Villages	Geographical Location
Khammouane	Nakai	1	Inundation zone
Khammouane	Gnomalart	11	Escarpment
Khammouane	Boualahpa	4	Escarpment and inundation zone
Bolikhamxay	Khamkerd	38	Route 8 and Nam Kata
	Total	54	

The WMPA will be active in the PIZ through a cost-sharing partnership approach with local authorities and NGOs working in the area. The approach will include the same elements as for NPA villages, thus providing livelihood development support as compensation for any access restrictions imposed due to SEMFOP. The approach also aims to promote PIZ villagers as full partners and 'gatekeepers' to the NPA through training, capacity-development, awareness-raising and support programs. PIZ villages will be prioritised according to their reliance (and thus impact) on NPA resources and activities initiated first in these high priority villages, some of which have already been identified by the PIZ Village Survey conducted in June and July, 2004. It is the intention under the SEMFOP to eventually provide such assistance and support to all PIZ villages according to the schedule presented in Table 2.3 (Section 2.2.7).

A survey of PIZ villages was conducted in June and July 2004 by a team of independent consultants to collect the information necessary to ensure that their current situation and needs are adequately covered by the SEMFOP (Anon. 2004). The survey covered 54 villages with a total population of 22,504 individuals and collected information on demography, ethnicity, socio-economic conditions, resource use and their relationship with the NPA. The survey was conducted by 3 field research teams comprising a team leader, one field assistant, and one WMPA staff member. Each survey team spent 1-2 days in each village and

collected village level data using a systematic semi-structured interview format with information recorded on standardized data forms. Summaries of the findings of the survey are presented in Sections 3.4.4. and 3.5.5.

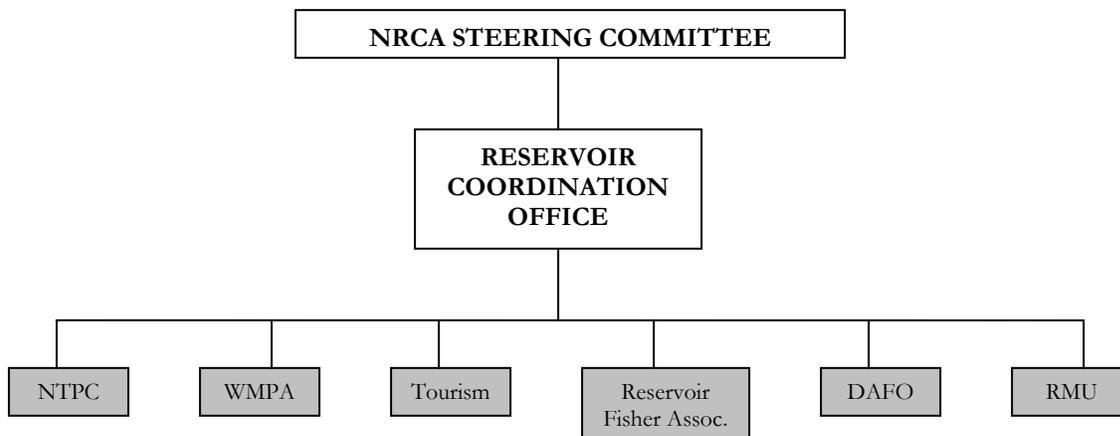
1.4.3: The NT2 Reservoir

The reservoir and drawdown areas are a complex matrix of permanent water, annually flooded areas and non flooded areas (islands). Thus, there may be potential for as yet unknown environmental impacts, such as proliferation of water weeds, water borne diseases or other problems. Water navigation and transportation channels are proposed for villages along the banks of the reservoir, and for fisheries and for access to villages inside the protected area. It will also be the access route to the NT2 watershed/NPA, and maintenance and control of this access will be a major issue in the future. While the zonation and management of the reservoir is likely to be very complex, it is envisaged that zonations will include area’s zoned for hydropower water-intake, agriculture, fishing, fish breeding, transport, recreational, etc.

Thus, there will likely be a wide diversity of uses of the reservoir, and a range of stakeholders. Many of the uses will be competitive or even in conflict. Because the reservoir will border directly with the NT2 Watershed/NPA and because power generation, livelihood activities of resettled villagers, and the reservoir transport system, are all likely to have significant impacts on the PA, it is essential that the WMPA, along with other stakeholders, are closely involved in all reservoir management decisions.

In order to manage these diverse interests and functions, a Nakai Reservoir Coordination Authority (NRCA), comprising representatives of all the major stakeholders, will be established to formulate policy and take all major decisions in regard to reservoir management (Figure 1.1). Funding for this office will come from the NT2 Social and Environmental Remediation Fund.

Figure 1.1: Nakai Reservoir Coordination Authority organizational structure



Due to the annual filling and then draw down in the NT2 reservoir, it is expected that the reservoir's surface area will change considerably throughout the year, as follows:

- Reservoir surface area at maximum capacity (November) = 450 km²
- Reservoir surface area at minimum capacity (June) = 75 km²
- Exposed area at maximum drawdown = 375 km², or 83 % of maximum capacity.

Annual drawdown of the reservoir will leave a ‘no-mans-land’ on the southern border of the NPA. This area (See Map 14 in the Folio of Annexures) will present considerable challenges to management from both livelihood and natural resources management perspectives. There may be potential for annually flooded forests, recession rice and crops, floating rice, grazing and fisheries, all of which are specified as potential

income sources for resettled villages. It will also be the water source for the proposed irrigation in resettlement village permanent agricultural areas. It has considerable potential for tourism and may also develop into a significant reservoir of wildlife. Clearly, from a conservation perspective, use of the northern drawdown area of the reservoir where it abuts the NPA will have to be very different from those allowed along the southern shore. Rules and regulations for access and permitted uses in these areas will be drawn up in conjunction with the NRCA.

1.4.3.1: Special Conservation Areas

Inundation of the reservoir will form a number of seasonally flooded areas in ‘embayments’ on the tributaries on the northern shore, on the southern shore bordering the resettlement area and in the “thousand islands area” of the reservoir. These areas represent potentially valuable habitats for many types of fauna including species of conservation significance especially the White winged duck, and form spawning and refuge areas for fish. Recognizing the biodiversity, fisheries and hydropower-related importance of these areas, they will be designated as ‘Special Conservation Areas’ (SCA) to be managed under a co-management framework with the Nakai Reservoir Coordinating Authority (NRCA). These areas will be legally recognised under the decree establishing the RCMA, and will be specifically identified in the decree using a map.

Although the WMPA will have overall management and funding responsibility for the SCA, NTPC will retain the water rights as described in the CA, the right of access for construction activities, and right of access for implementing their environmental and social responsibilities as contained in the CA. NTPC will provide additional financial and implementation support for species-specific studies in the in the SCA up until 5 years post-COD. At that time the WMPA will be responsible for species specific programs in the area.

The special status of the SCA will be reflected in the Village Forest and Land-use Management Agreements (VFLMA) to be developed with resettlement villages who have rights to the fisheries resource in the reservoir (See SDP Chapter 19, Section 19.8 for details of FLUPAM in the Plateau Resttlemnt Area). Ideally, the SCA would be designated as totally protected zones (TPZ) under these VFLMAs. Such a status would be in line with villager interests by providing fishery conservation areas for fish refuge and breeding; and the distance of the reservoir draw-down zone in the SCA from the resettlement villages means that its demand for agriculture or livestock grazing would be minimal.

Given its totally protected status and its distance from villages, patrolling will be by WMPA staff with possible police or military support. Patrolling will be by boat with draw-down area inspections conducted at intervals on foot (See Table 2.4, Section 2.3.3). As any potential illegal access to the SCA would invariably be by boat, demarcation will be by signs at the mouth of each embayment and across the thousand islands.

The biodiversity and fishery values of the Special Conservation Area will not be known precisely until some years following reservoir inundation, after the ecology has adjusted to the new water regimes. Consequently, management activities can only remain indicative at this stage and will have to be constantly reviewed and adjusted as the new habitats develop and become better understood. Proposed management activities in the SCA will include:

1. Protection and Rehabilitation of Forest Cover. Activities will focus on protection of the vegetation cover from human influenced activities other than those associated with reservoir formation and hydropower project construction activities.
2. Conservation, maintenance and promotion of biological diversity coupled with the development of culturally-rich, national park appropriate for tourism and scientific research. Activities will focus on biodiversity conservation and promotion including restricting access, public awareness, controlling wildlife poaching and conserving and enhancing habitat. Scientific research on species and habitat will also be a major activity. The development of the Special Conservation Areas for tourism will only be considered at a later date.

3. Building and strengthening capacity of the authority and those stakeholders contributing to management and implementation of the authority's activities. Establishing the WMPA and strengthening staff capacity to effectively protect and manage the NNT-NPA and these Special Conservation Areas will receive emphasis during this period. After this period, a greater role for the Reservoir Authority, and district and provincial authorities under the supervision of the WMPA will be considered.
4. Facilitation of improved livelihoods for inhabitants of the NT2 Watershed-NPA by focusing on poverty reduction through environmentally sustainable development. As no one lives in these Special Conservation Areas, the livelihood issues relate to its potential contribution as a refuge and breeding area for the reservoir fisheries. The Special Conservation Areas will thus be managed to conserve and enhance the habitat in the area to benefit the reservoir fisheries production.
5. Prudent management and effective use of funds for the purpose of furthering the above objectives. This will be a focus activity of the WMPA and will cover the funds the WMPA will use to manage the Special Conservation Areas.

1.4.4: Nam Chat–Nam Phan Provincial Protected Area

The SEMFOP does not include activities or a budget for the area previously called the 'northern extension'. This is for a variety of reasons.

- i. The northern extension is the upper catchment of the Theun-Hinboun hydro-electric generating facility. This catchment will become even more crucial (for the THPC) once the NT2 reservoir is built and waters diverted away from the Nam Theun.
- ii. The GOL considers the water user pays principle as a cornerstone on current and future hydroelectricity development. Besides this plan for the NT2 project, the developers of the Nam Leuk project, the EdL, are committed to providing funds for the management of the projects watershed and the Phu Khao Khwai NPA of which it is a part (a firm geographical connection of the Nam Leuk watershed and the rest of the NPA). The ADB is working towards a similar principle in the (somewhat more complex) Nam Ngum watershed. This principle should also be followed, if somewhat retrospectively, in the Theun-Hinboun watershed, and certainly in the planned NT3 watershed.
- iii. As noted above, the NT3 hydroelectric facility is now being considered, and this facility will be totally dependant on the previously termed 'northern extension' for its upper headwaters.
- iv. The so-called 'northern extension' area has relatively marginal physical connections to the NT2 Watershed/NPA. While it may biologically and ecological similar, any connections in terms of cross fertilisation or terrestrial wildlife passage have not yet been identified. Similarly, it has not been demonstrated that inclusion of this 'northern extension' in the NT2 Watershed/NPA is all necessary to create a 'critical habitat range/area' required to support viable populations of wildlife or flora (in the NT2 Watershed/NPA). On the other hand, other wildlife passages, which may be more viable and necessary, have now been included in the NT2 Watershed/NPA, by designation of the two corridors to the Phu HinPoun and Hin Nam Nor NPAs

Much of the previously proposed 'northern extension' has now been designated as the Nam Chat-NamPhan Provincial Protected Area⁹, and a management plan developed for the management of this PPA and the GoL is now seeking funding from appropriate sources (See Section 4.1.3.1).

⁹ Of the 762 km² area of the previously proposed northern extension, 432 km², or 57 % is included in the Nam Chat-Nam Phan PPA.