Nong Bong Kai Strategic Wetland Management Plan

Chiang San District, Chiang Rai Province

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Chiang San District, Chiang Rai Province

Chiang Rai Province
Office of Natural Resources and Environmental Policy and Planning
Danish Agency for Development Assistance (Danida)
Implementation of the Ramsar Convention,
Management and Protection of Wetland Areas

Table of Contents

Table of Contents i

List of Maps iii
List of Photos iii
List of Tables iii
Acknowledgements iv
Message from the Senior Technical Advisor v
Message from Provincial Project Director vi
Forward vii
Executive Summary viii

PREAMBLE 1

NONG BONG KAI WETLAND 1

PART 1. *BACKGROUND INFORMATION* 2

Planning Area 2
Location and Status of Nong Bong Kai Wetland 5
Physical Features 5
Topography, rainfall and drainage 5
Soils 7

Ecological Features 7
Plants 7
Wildlife 11

Physio-chemical Features 12
Socio-economic Features 13
Resource Uses 14
Economic Values 14
Policies and important development projects related to the wetlands 15
Feasibility Study - Inland Container Depot (ICD) 15

PART 2. *THE STRATEGY* 17

Introduction 17
The Principles 17
The Ramsar Convention's New Guidelines for Management Planning 17
Core Concepts 17

Vision Statement 18
Issues, Goals, Objectives, Actions and Indicators 20
Physical 20
Issue 1: Water Quantity 20
Biological 20
Issue 2: Ecosystem Degradation 20
Issue 3: Fish Habitat 21
Issue 4: Water Bird Habitats 22
Physio- Chemical 23
Issue 5: Water Quality 23
Use and Management 23
Issue 6: Land Development 23
Issue 7: Ecosystem Awareness 24

Management Zones 25

1. Wetland Protection Zone 25

2. Wise Use Zone 25
3. Intensive and Multiple Uses Zone 25

Management Zones and Management Intents *28*

PART 3. *IMPLEMENTATION PLAN* **31**

Project and Budget Summary *31*
Implementation of the Strategic Plan *31*
Training of related officers and stakeholders 32
Formulation of plans, projects and activities 32
Budget Requisition for Implementing Plans, Projects and Activities 33
Monitoring and assessment 33
Tools for monitoring and assessment 33

Appendix 1. ..... **35**

Table Linking the Issues to Goals, Objectives, Guidelines, Strategic Actions and Indicators *35*

Appendix 2. ..... **42**

Table Linking Strategic Actions, Projects, Budget and Responsibilities *42*

Appendix 3. ..... **55**

Project Proposal example *55*
Surveillance and Monitoring Water Quality in the Nong Bong Kai Non-Hunting Area 55

Appendix 4. ..... **57**

Order No. 1802 / 2547 Chiang Rai Provincial Office 57

References **58**

List of Maps

Map1. Non Bong Kai Non-Hunting Area in the Sub Districts of Pa Sak and Yo Nok 3

Map 2. Location of the Nong Bong Kai – Nong Luang Wetland Complex, Chiang Rai Province (Trisurat, 2003, p.18) 4

Map 3. Topography and Drainage of the Planning Area 6

Map 4. Landsat 7 ET+ 2003 - Nong Bong Kai Wetland 8

Map 5. Generalized Land Cover - 2003 9

Map 6. Nong Bong Kai Zoning of Sub Districts 26

Map 7. Nong Bong Kai - Details of Zoning for Catchment Area 27

List of Photos

Photo 1. Nong Bong Kai Lake from the North West looking South East 2

Photo 2. Mimosa sp. – Giant Sensitive Plant 11

Photo 3. *Anas querquedula* - Garganey 11

Photo 4. *Mycteria leucocephala* - Painted Stork 12

Photos 5. Stakeholders involvement in decision making 18

List of Tables

Table 1. Land Use of Tambons Pa Sak and Yo Nok, Chiang Saen District in 1989 and 2003 7

Table 2. Number of water birds and ducks found in important habitats around Nong Bong Kai Lake 12

Table 3. Name of villages, number of families, population, and income -Tambons Pa Sak and Yo Nok 13

Table 4. Economic Values of using Nong Bong Kai and adjacent areas 15

Table 5. Management Zones Intents and Extent 28

Table 6. Table of Compatible Activities for Nong Bong Kai Catchment Area [See Map 6] 30

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The Strategic Wetland Management Plan for the Nong Bong Kai area, Chiang San District, Chiang Rai Province was completed as a result of the effort and good cooperation of the organizations, agencies, committee, sub – committee and various people involved in the preparation of the Strategy.

The strategy formulation team would like to thank the Danish Agency for Development Assistance (DANIDA) for supporting the Implementation of the Ramsar Convention Management and Protection of Wetland Areas (MPW) Project and, Royal Danish Embassy, Thailand for strong support, especially·Mr. Rene Andersen (Counselor on Environment and Development) and Mr. Chatree Moonstan.

Also thanks are given to the Project Steering Committee, PAMT-Nong Bong Kai Non-Hunting Area (Ang Chiang San) for overseeing the project preparation and providing the comments useful for formulating the Strategy. Thanks to everyone on the team that drafted the Strategy for their dedication of time and effort.

Thanks to Dr. Kasemsun Chinnavaso, Project Director and Deputy Secretary General of Natural Resources and Environment Policy and Planning, Mr. Santi Booprakub, Project Manager and Director of Natural Resources and Environmental Management Division, Dr. Nawarat Krairapanond, Project Co-ordinator and Chief Coastal Resource Management Section for their active involvement and leadership, Mr. Barry Hall, Senior Technical Advisor of the MPW project for overseeing, providing comments and for support in implementation. Lastly, the working team would like to thank the former Chiang Rai Provincial Governors (Mr. Worakiat Somsoi and Mr. Narin Panichkul) and the present and the former Deputy Provincial Governors (Mr. Nopporn Tonrab and Mr. Direk Konkleep), Chief of Chiang Rai provincial Strategy Group (Mr. Watchrin Sathiranont), Superintendent of Nong Bong Kai Non-Hunting Area, Pa Sak Tambon Administration Organization, Yo Nok Tambon Administration Organization and the local people for their cooperation in formulating the strategy.

Message from the Senior Technical Advisor

Wetlands are of major importance in the history, culture, livelihood and community's way of life in Thailand but population growth and economic expansion, over the past few decades, has intensified competition for land and water resources and is threatening the country's wetlands.

In 1998, Thailand became a Contracting Party to the Convention on Wetlands (Ramsar) and, since that time, efforts to manage wetland resources for wise use and conservation have been strengthened. The Office of Natural Resources and Environmental Policy and Planning (ONEP), the national focal point for implementing the Convention has formulated national policies and plans, conducted a national inventory, carried out studies on biodiversity conservation and sustainable use of important wetlands and designated ten Ramsar sites. They have also appointed a National Committee on Wetlands Management, Chaired by Deputy Permanent Secretary of Ministry of Natural Resource and Environment with members from relevant agencies, NGOs and technical experts.

It is very important that the national government makes wetlands a resource management priority, and support from the Ramsar encourages that treatment. It is equally important that local authorities and communities fulfill their environmental management responsibilities, as directed in the 1997 Constitution and reflected in the government's decentralization policies.

In 2001, the Governments of Thailand and Denmark signed a Memorandum of Understanding (MOU) to participate jointly in the "Implementation of the Ramsar Convention, Management and Protection of Wetlands" or MPW project to enhance the sustainable management and wise use of Thailand's wetlands, in accordance with the requirements of the Ramsar Convention. The project selected two Ramsar site pilot areas: Nong Bong Kai Non-Hunting Area and the Krabi Estuary; to develop and implement participatory wetland management plans.

At Nong Bong Kai, the project has facilitated increased understanding of wetland values among local stakeholders, and brought government, communities, NGOs and the private sector together to jointly prepare their integrated wetland management plan. This document provides a vision for the future of the site and a strategy to realize that vision. It also represents the commitment of all key stakeholders to work together for the conservation and sustainable use of this internationally important wetland. Finally, I would like to acknowledge the Strategic Planning Team of Nong Bong Kai Ramsar Site, Dr. Yongyut Trisurat and his team for their efforts to successfully formulate this document.

Mr. Barry Hall
Senior Technical Advisor
MPW Project

Message from Provincial Project Director

Chiang Rai is one of the provinces selected for Implementation of the Ramsar Convention Management and Protection of Wetland Areas with Nong Bong Kai Non-Hunting Area, Chiang San District, Chiang Rai Province as the pilot site. Formulation of a Wetland Management Strategy is important as a framework for the management and wise use of the wetlands. The Strategy leads from vision, issues, goals and objectives to a work plan and budget for each of the related organizations. This is consistent with the provincial development approach under the management principle of CEO provincial governor.

The Chiang Rai Province would like to thank the Working Team Members of the Nong Bong Kai Strategic Wetland Management Plan, and various related organizations for the excellent cooperation that has resulted in the completion of the Nong Bong Kai Wetland Management Strategy. Particular thanks are given to Mr. Narin Panichkul (former Governor of Chiang Rai), Mr. Direk Konkleeb (former Deputy-Governor of Chiang Rai), the Office of Natural Resources and Environmental Policy and Planning for overseeing and encouraging the formulation of the strategy, and especially to the and the Danish Agency for Development Assistance (DANIDA) for providing financial support for the project. It is expected that the Strategic Wetland Management Plan Strategy will strengthen the current management of Nong Bong Kai Ramsar site, and encourage multi-stakeholders at the community level to participate in conservation and wise use of their wetland resources. In addition, this Strategic Wetland Management Plan will be used as a prototype for the remaining Ramsar Sites and other wetlands in Thailand and neighboring countries.

Mr. Nopporn Tonrab
Deputy Governor of Chiang Rai Province
Chiang Rai Provincial Project Director

Forward

Since 1992, Thailand started to prepare to be a contracting party to the Ramsar Convention for conserving and encouraging wise use of wetlands. Thailand has performed several obligations following the RAMSAR Convention such as formulating in B.E. 2541-2545 the national strategy and implementation plan for conservation and wise use of sustainable wetlands. Thailand became the 110th contracting party to the RAMSAR Convention on 13th September 1998. In 1999, The Office of Environmental Policy and Planning (OEPP) surveyed and registered the list of wetlands in Thailand. In addition, the wetlands that were classified as International and National important wetlands in Thailand, as well as measures for wetlands conservation were submitted to the Cabinet for approval in 2000.

There are presently 10 Ramsar sites in Thailand. With the assistance of DANIDA and The Office of Natural Resources and Environmental Policy and Planning that acts as the national focal point, the Implementation of the Ramsar Convention Management and Protection of Wetland Areas (MPW Project) has been undertaken. The project duration is 2002-2006. Nong Bong Kai wetland, Chiang Rai province and Krabi Estuary, Krabi Province are selected to be the pilot sites. The formulation of the wetland management strategy for Nong Bong Kai is an important activity under the pilot project because of it encourages the local stakeholders including Government agencies, NGO, Local Administration Office and people to join in consideration of wetland management with support from technicians and experts.

The Office of Natural Resources and Environmental Policy and Planning hopes that implementation of the Strategy results in the restoration of the Nong Bong Kai wetland and in the provision of benefits to the people in Chiang Rai province forever.

We would like to thank Government of Denmark for budget support, the Faculty of Forestry, Kasetsart University for technical support and Chiang Rai Provincial Office and everyone on the team preparing the Nong Bong Kai Strategy for their exertion, their knowledge and ability to achieve success.

Dr. Kasemsun Chinnavaso
Deputy of Secretary General of
Natural Resources and Environment Policy and Planning
Project Director of Thailand

Executive Summary

The Strategic Wetland Management Plan of Nong Bong Kai, Chiang San District, Chiang Rai Province was formulated under Implementation of the Ramsar Convention Management and Protection of Wetland Areas Project (MPW) with the financial support from the Danish Government - DANIDA and, The Office of Natural Resources and Environmental Policy and Planning as the Thai agency responsible for the project.

The strategy was formulated based on four basic principles:

1) ecosystem management;
2) wetland conservation and wise use;
3) multi-stakeholder participatory planning; and
4) precautionary approach.

The working planning team included approximately 40 individuals appointed by the Chiang Rai Provincial Governor. Three formal workshops were held during June to September 2004 with technical support from the Faculty of Forestry, Kasetsart University and international specialists on wetland ecology and planning who worked as planning facilitators. The Strategy was prepared following extensive stakeholder preparation and community network development, during 2002-2003; studies of the wetland ecosystem, wetland resource use, wetland economic valuation; and the development of a wetland GIS database.

The Nong Bong Kai Strategic Wetland Management Plan consists of 3 main parts:

Part 1: History and background information,
Part 2: The 20 year strategy – 2004 to 2024, and
Part 3: The 5 year operational plan – 2004 - 2008.

The Nong Bong Kai Vision:

"To have abundant waterbird and fish species, and to increase the natural heritage and beauty of Nong Bong Kai lake for eco–tourism. The Non-hunting Area will seek cooperation from all local stakeholders to protect, conserve and rehabilitate deteriorated areas for conservation and sustainable wise use of the wetland resources"

Three mission statements of the Strategy are:

1. To restore Nong Bong Kai wetland and surrounding areas to the natural healthy state for maintaining and functioning wetland values.
2. To strengthen the effectiveness of protection and conservation of Nong Bong Kai through the participation of local multi-stakeholders and related organizations.
3. To encourage wise use of Nong Bong Kai wetland and promote it to be a well-known eco-tourism destination in Thailand.

For the vision and missions to succeed, the working planning team prepared the strategy details consisting of goals, objectives, guidelines, strategic actions, indicators and management zones covering the two Tambons, Pa Sak and Yo Nok. The working planning team defined projects, budget, the responsible agencies and project areas. These projects will be implemented over the 5 year period 2004-2008. There are 45 projects with a total budget of 46.55 million Baht. The central, regional and local organizations (Provincial Administration Organization and Tambon Administration Organization) are the main focal point for implementation. The implementation is based on the principle of Area – Function

Participation. The projects implemented in 2004 are funded by the MPW project. Initially, the projects implemented in 2004 will apply for the support from the MPW project. The small projects that affect the quality of life of the local people will apply for the support from Local Administration Organization while the larger projects covering larger areas and affect the overall picture will apply for the support from the related provincial organizations or central organizations.

For monitoring and assessment, Chiang Rai Provincial Office will be responsible for training the officers and stakeholders to have knowledge and understanding so that they can apply the strategy to effective actions consistent with the roles and responsibilities of the organizations. The monitoring with the participation of government agencies and local people is designed in 3 levels:

1. The progress of applying the strategy to implementation;
2. The progress of project implementation; and
3. The awareness of stakeholders and the change in status of wetland ecosystem and environment.

The results of monitoring will assess the effectiveness of project implementation and how far it achieves the vision, goals and objectives defined in the strategy. These outputs are valuable for current management to adapt and improve future implementation of the strategy that will lead to gaining support from the communities and responsible agencies in the future.

PREAMBLE

NONG BONG KAI WETLAND

The Office of Natural Resources and Environmental Policy and Planning (ONEP), of the Thai Ministry of Natural Resources and Environment assisted by DANIDA (Danish International Development Assistance) is undertaking a project, *The Implementation of the Ramsar Convention in Thailand: Management and Protection of Wetland Areas Project* (MPW) over a 5 year period from July 2001 to September 2006. The main objective is to support and promote sustainable wetland wise use and management in Thailand. Two Ramsar sites have been selected to be pilot projects, the Nong Bong Kai Non-Hunting Area, Chiang Rai Province and, the Krabi Estuary, Krabi Province.

The MPW Project aims to prepare Strategic Wetland Management Plans that are consistent with the ecological potential of the wetlands and the needs of people in the areas. The Plans are prepared with local peoples' participation. The plans will be a frame on which a deeper understanding between local government organizations, private individuals and groups and be developed about the challenges of wetland management. The capacities of staff of the central, region and local related organizations will be strengthened on wetland management through a 'learning by doing' approach to preparing the plans and delivering projects and management actions to meet the goals and objectives of the plans.

The ***Nong Bong Kai Strategic Wetland Management Plan*** (SWMP), was prepared by the PAMT-Chiang Rai. There are 42 persons on the Working Planning Team consisting of representatives of government organizations [22 persons], local administrative organizations [8 persons], local leaders and conservation groups [5 persons], and a wetland user group [5 persons]. Wetland ecology specialists and natural resource management planners worked as planning facilitators and provided technical information for the Working Planning Team.

The draft SWMP document was prepared over a 3 month period (June – August 2004) through three formal workshops, and feedback sessions provided by organizations and stakeholders. This strategy preparation was possible only after extensive stakeholder preparation and training, over a 2-year period was completed, and the spatial database including a Geographical Information System (GIS) was available to aid the PAMT in its decision-making.

The Nong Bong Kai Strategic Wetland Management Plan focuses on the important issues identified by the stakeholders related to wetland ecology, conservation and sustainable wise use in the catchment area of Nong Bong Kai Lake. This Plan has a 20-year time horizon - 2004-2024. The strategies and projects are developed for delivery over a 5-year period, 2004-2008. It can be adapted as changes occur in the environmental, socio-economic and policy situations affecting the area.

The Management Plan is made up of three integrated parts.

Part 1: History and background information,
Part 2: The 20 year strategy – 2004 to 2024, and
Part 3: The 5 year operational plan – 2004 - 2008

Part 1 summarizes the history and background information that was used by the Working Planning Team and PAMT in their decision-making. Part 2 is the 20-year Strategy that defines the direction and types of actions that the Stakeholders wish to follow to strive to reach their Vision of Nong Bong Kai wetlands. Part 3 defines the implementation actions that will be undertaken, and the monitoring and evaluation approaches that the Stakeholders will follow.

PART 1. BACKGROUND INFORMATION

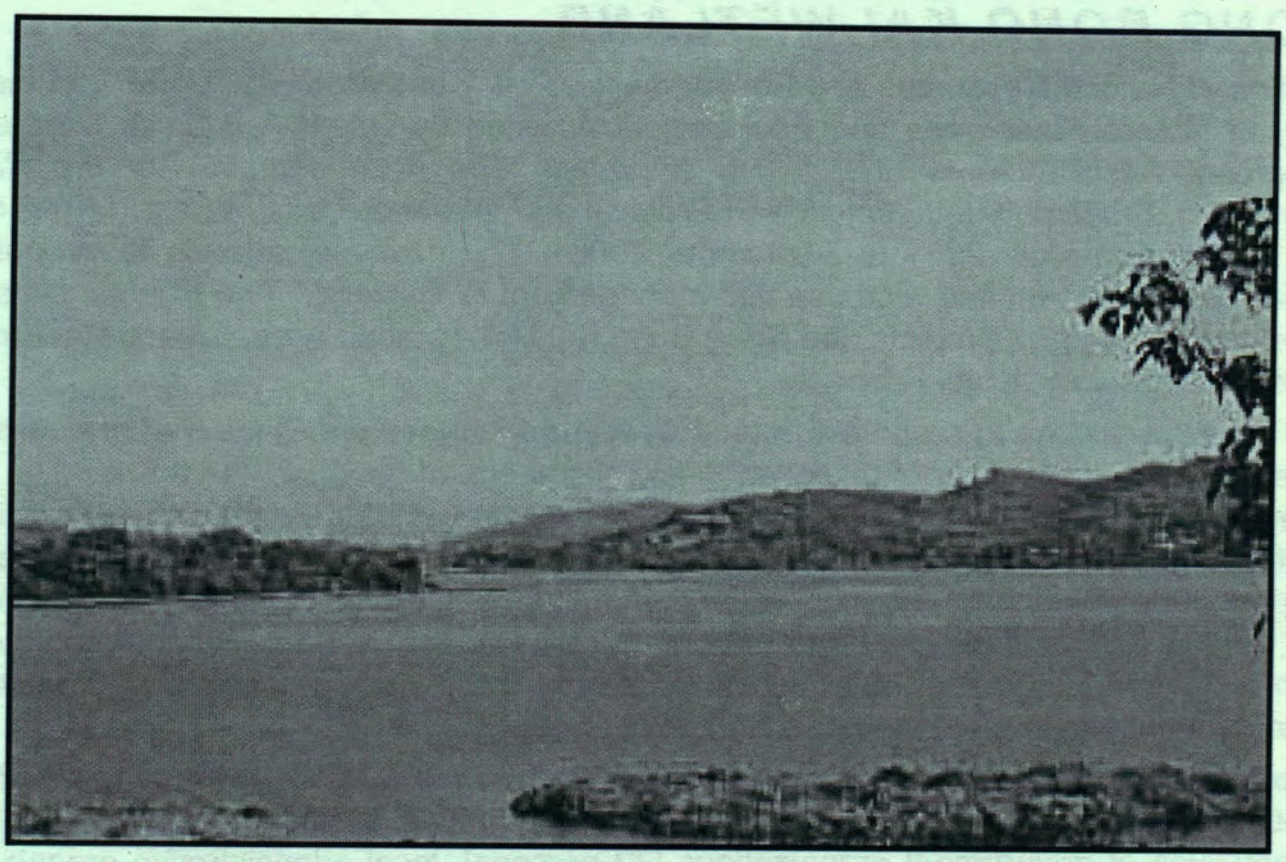
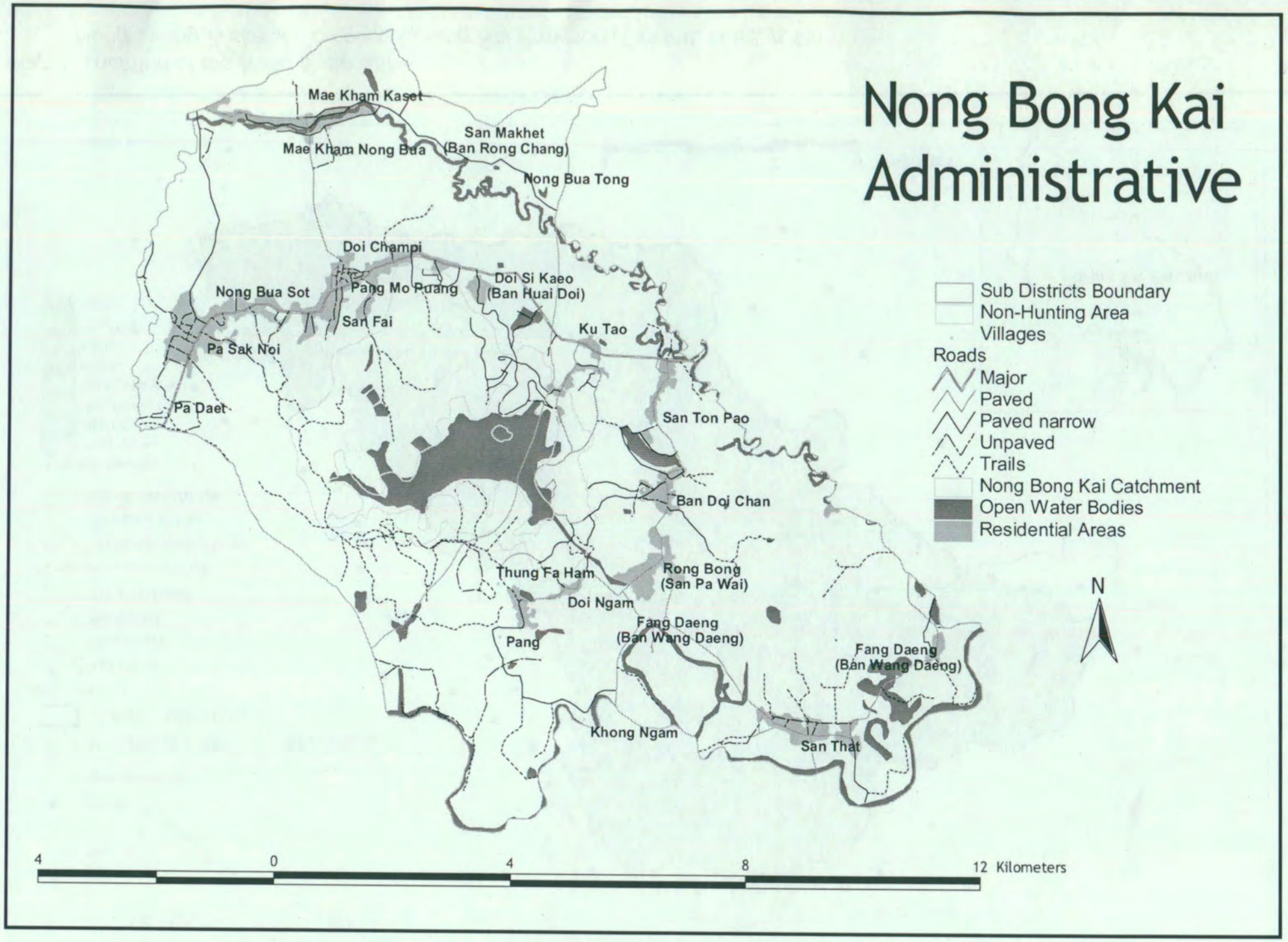


Photo 1. Nong Bong Kai Lake from the North West looking South East

Planning Area

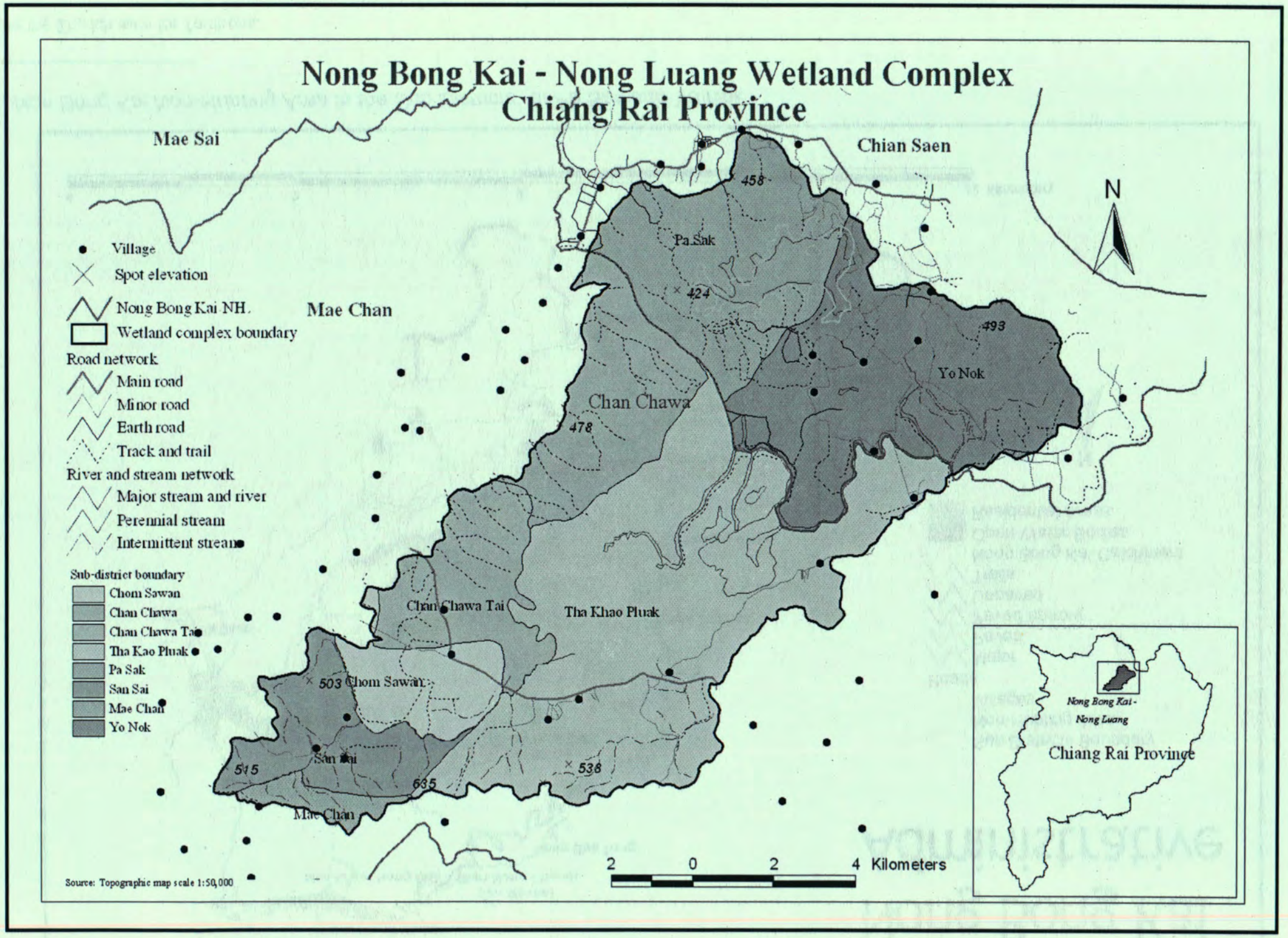
The Strategic Nong Bong Kai Wetland Management Plan covers 100.71 km^2 in the tambons of Yo Nok and Pa Sak, Chiang Saen District, Chiang Rai Province. Within the planning area there is the Nong Bong Kai Catchment area and within that, the Nong Bong Kai Non-Hunting Area which is designated as the Ramsar Site in 2001.

Information has been gathered and analyzed with emphasis placed on the catchment area. The participation, information gathering and analysis have also covered the local administrative units, tambons, so that the project can be implemented effectively. The planning has also considered external factors in the Nong Luang – Nong Bong Kai wetland complex, the province and the region that may have either positive or negative effects on Nong Bong Kai management. (Trisurat, 2004)



Map1. Non Bong Kai Non-Hunting Area in the Sub Districts[1] of Pa Sak and Yo Nok

[1] Sub Districts are the English term for Tambons.



Map 1. Location of the Nong Bong Kai –
Nong Luang Wetland Complex, Chiang Rai Province (Trisurat, 2003, p.18)

Location and Status of Nong Bong Kai Wetland

Nong Bong Kai Lake or Ang Chiang Saen is located in Tambons Yo Nok and Pa Sak, Chiang Saen District, Chiang Rai Province, between north latitude 20° 28' 25" to 20° 40' 55" and east longitude 100° 6' 17" to 100° 7' 38".

This area used to be an intermittent floodplain surrounded by low mountains and hills. The villagers constructed an earthen dam on the Lua River to store the water for agricultural uses. After that the Accelerated Rural Development Office built a special weir across the river, to stop the water from flowing out, and a small lake covering 2700 rai was created - "Chiang Saen Lake" locally called Nong Bong Kai Lake. The lake now supplies water, and is a tourist and outdoor recreation attraction for Chiang Rai Province.

Increased population and development in the area has caused destruction of the water birds' habitat, and facilitated bird hunting and over-fishing in the lake. Chiang Rai Province thought that if the area was left without supervision, several species of waterfowl visiting the lake may become extinct in the area. Chiang Rai Province requested the Royal Forest Department to declare the water area as a Non-Hunting Area. Thus Nong Bong Kai Non-Hunting Area was formally declared on 4th April 1985 by the Ministry of Agriculture and Cooperatives.

According to the law, the Non-Hunting Area is under public ownership but is located outside the national reserve forest and watershed forest. Most of area covers the water and a narrow strip forest. It has been registered as the 5th Ramsar Site of Thailand on the 5th May 2001, and the 1101st Ramsar Site in the world. Thailand became the 110th Contracting Party of the Ramsar Convention on 13th September 1998. All of the area surrounding the Non-Hunting Area belongs to private individuals. The boundary of the area has not been clearly surveyed and delineated on the ground so there is a tendency for people to intrude into the area. Government organizations and people understand that the boundary of the Non-Hunting Area is the boundary of the water but the water level fluctuates between the wet and dry seasons.

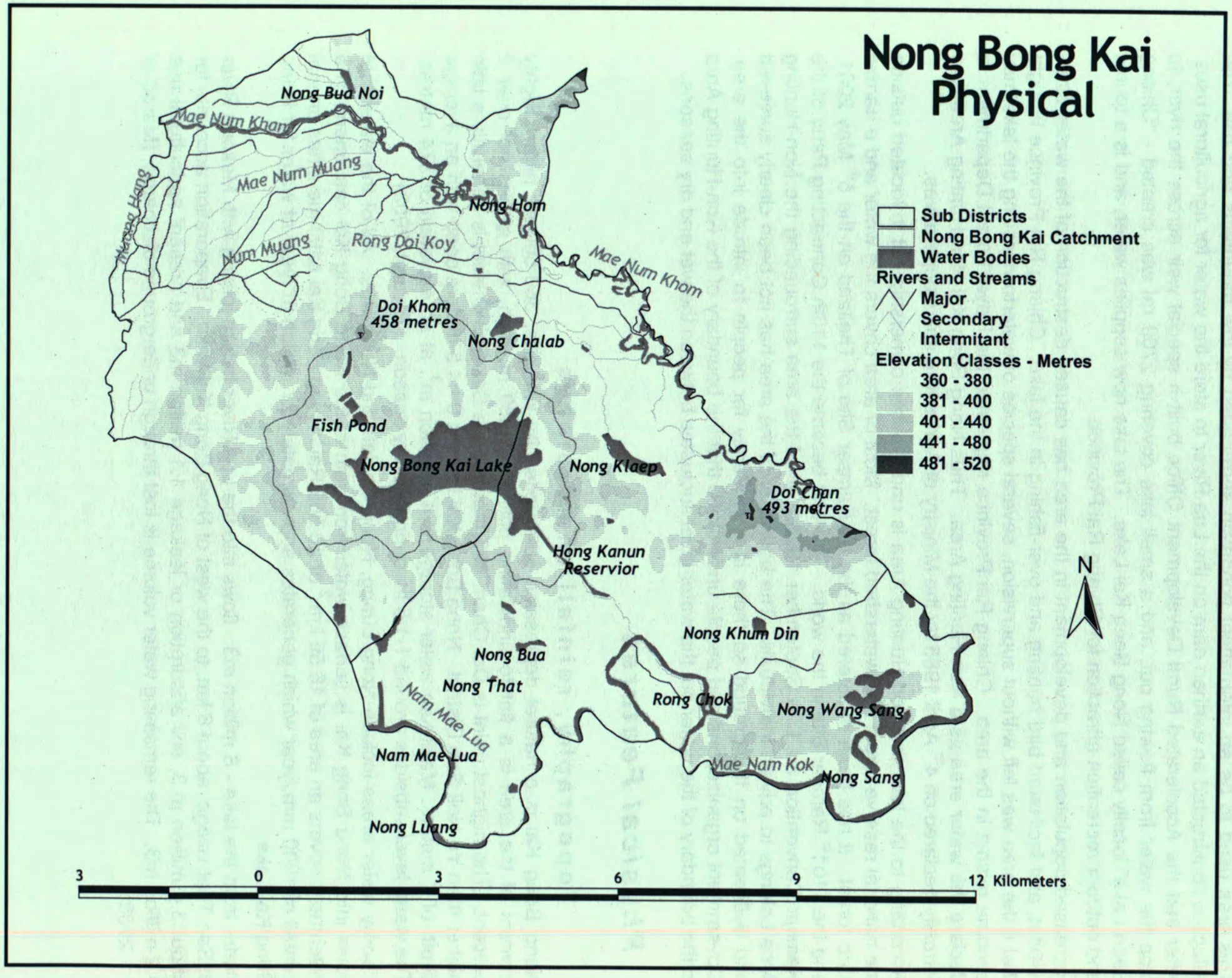
Physical Features

Topography, rainfall and drainage

Nong Bong Kai is a natural depression surrounded by low hills, 360-500 m. high. Eighty percent of the area is a flat to undulating plain, 360-380 m. high, with slopes not over 2 percent. The highest point is Doi Chan, 493 metres. Pa Sak Sub District is generally a little higher than Yo Nok Sub District. Nong Bong Kai Lake is 0 - 4.5 meters deep with an average depth of 2 meters. Maximum water storage is 4.9 million m^3. at an elevation of 374 metres. The water level subsides around 1-1.5 m. during the dry season. (Trisurat, 2003)

Nearby water areas include Nong Luang, Nong Chalab and Nong Bua. All of the water that flows into Nong Bong Kai is surface water from rain in the Nong Bong Kai catchment. The catchment covers an area of 16.59 $km.^2$ or 10,369 Rai. Nong Bong Kai catchment has annual rainfall of 1900 mm./year which generates approximately 27 million m^3/year of water for Nong Bong Kai Lake.

Water from the lake - 8 million m3 - flows into the Lua River before joining with Mekong River at San That village, about 6 km. to the west of Nong Bong Kai Lake. Evaporation accounts for about 3.4 million m.3, soil absorption or leakage 1.1 million m3 and present agricultural use 3.2 million m3. The remaining water volume is lost through underground discharge. (Marod et al., 2003)



Map 2. Topography and Drainage of the Planning Area

Soils

The Land Development Department revealed that the parent materials of the soil in the planning area were from residuum and local colluvium, and alluvium. Soil texture consists of clay, sandy/loam, stone and water. Forty-two percent of the area is suitable for rice farming, especially at Tambon Yo Nok, 22 percent is moderately suitable for crops but there are problems with soil drainage and soil erosion (Trisurat 2003).

About 93 percent of the area has a soil erosion rating of less than 5 tons/hectare/year which is considered a low erosion rate but top soil erosion in areas of old clearing and abandoned lands in hilly areas is greater. If water and soil conservation measures are not taken properly, it is expected that Nong Bong Kai Lake would be filled with sediment in the next 500 years.

Ecological Features

Plants

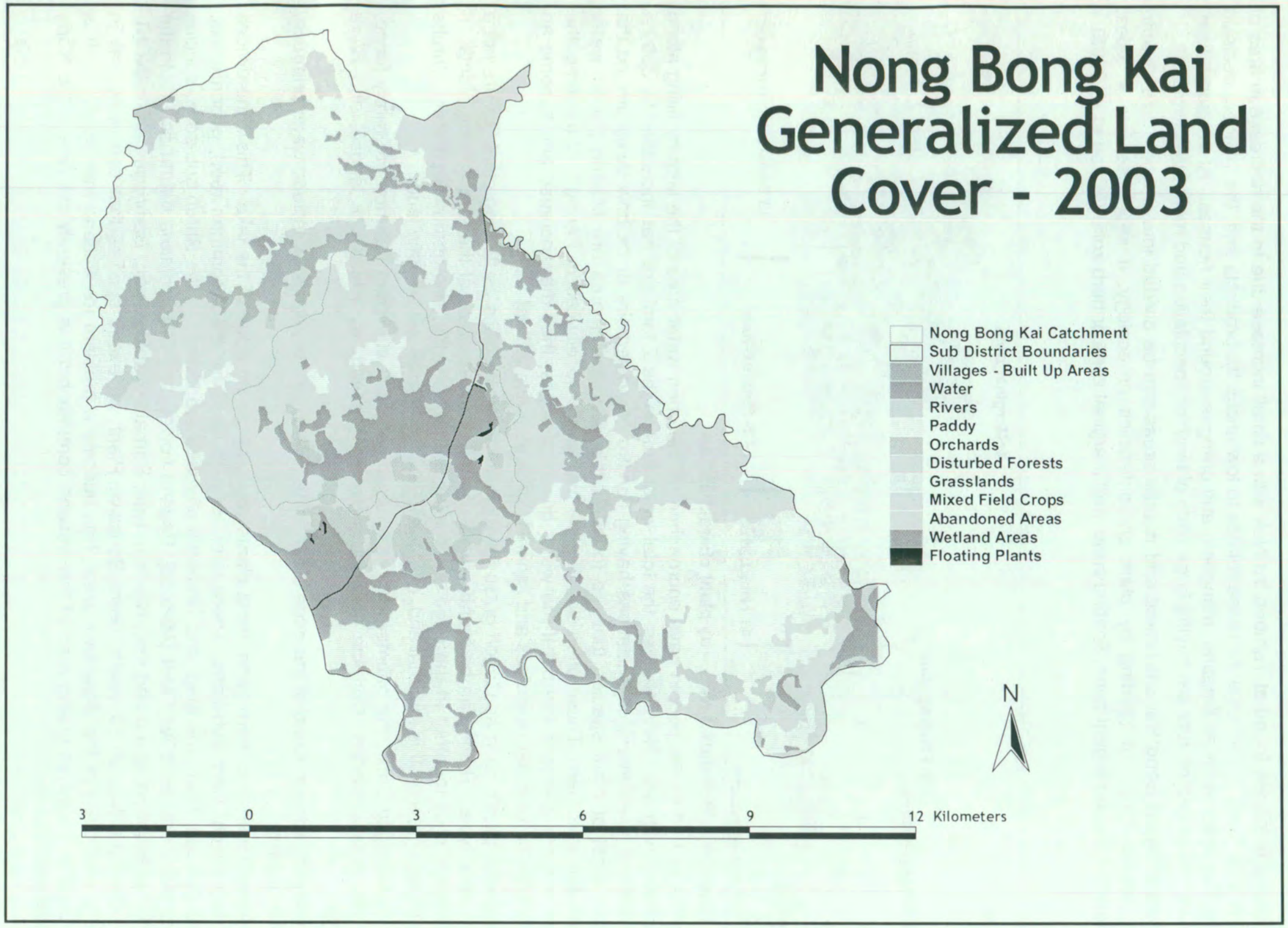
From the study of land use maps of the Land Development Department in 1989, and Satellite imagery interpretation of Landsat-7ETM+ and IRS in 2003, land use/land cover types around Nong Bong Kai are classified into 11 categories as shown in Table 1.

Table 1. Land Use of Tambons Pa Sak and Yo Nok, Chiang Saen District in 1989 and 2003

Types of Land Use	1989 [1/]			2003 [2/]			Changes
	km^2	Rai	%	km^2	Rai	%	+/- (Rai)
Crops	7.61	4,753	7.56	6.58	4,113	6.53	-644
Fruit Garden	0.59	367	0.59	3.31	2,069	3.29	1,700
Old Clearing or Shifting Cultivation	21.39	13,370	21.24	15.66	9,788	15.55	-3,581
Mixed Deciduous forest	5.02	3,135	4.99	8.63	5,394	8.57	2,256
Degraded forest or Bamboo forest	0	-	0.00	1.12	700	1.11	700
Paddy field	46.06	28,472	45.74	46.81	29,256	46.49	469
Marsh	2.34	1,460	2.32	4.81	3,006	4.78	1,544
Swamp	3.47	2356	3.74	2.17	1,356	2.16	-1,000
Built up areas, Villages	8.09	5,055	8.03	5.21	3,256	5.17	-1,800
Water bodies	5.83	3,641	5.79	6.39	3,994	6.35	350
Sand dune	-	-	0.00	0.005	3	0.00	3
Total	**100.70**	**62938**	**100.00**	**100.70**	**62934**	**100.00**	**-3**

1/ from Land Use Map (Land Development Department, 1989); 2/ from Satellite imagery interpretation (Trisurat, 2003)

Map 3. Landsat 7 ET+ 2003 - Nong Bong Kai Wetland



Map 4. Generalized Land Cover - 2003

Most of the Mixed Deciduous Forest is found on the hills. A comparison between data in 1989 and 2003 shows that Mixed Deciduous Forest area increased by 3.6 km^2. This is a result of the old clearing areas generating to forest and, with forest succession, an area of 1 km^2, changed to bamboo forest.

Most Paddy fields are found at Tambon Yo Nok with a small increase due to the decrease in area of field crops by 1 km^2. This crop decrease relates to low prices for products and, the villagers decision to plant fruit trees such as longans, mangoes, and oranges around their houses. At the same time, investors and entrepreneurs are buying large plots of land for speculation and more intensive uses.

Wetlands in Nong Bong Kai catchment and nearby areas can be divided into 3 types: open water, marsh, and swamp. If dividing by plant characteristics or ecology, it separates into 4 types; submerged zone, emergent zone, floating zone, and marginal zone or herb zone (Marod et al, 2003).

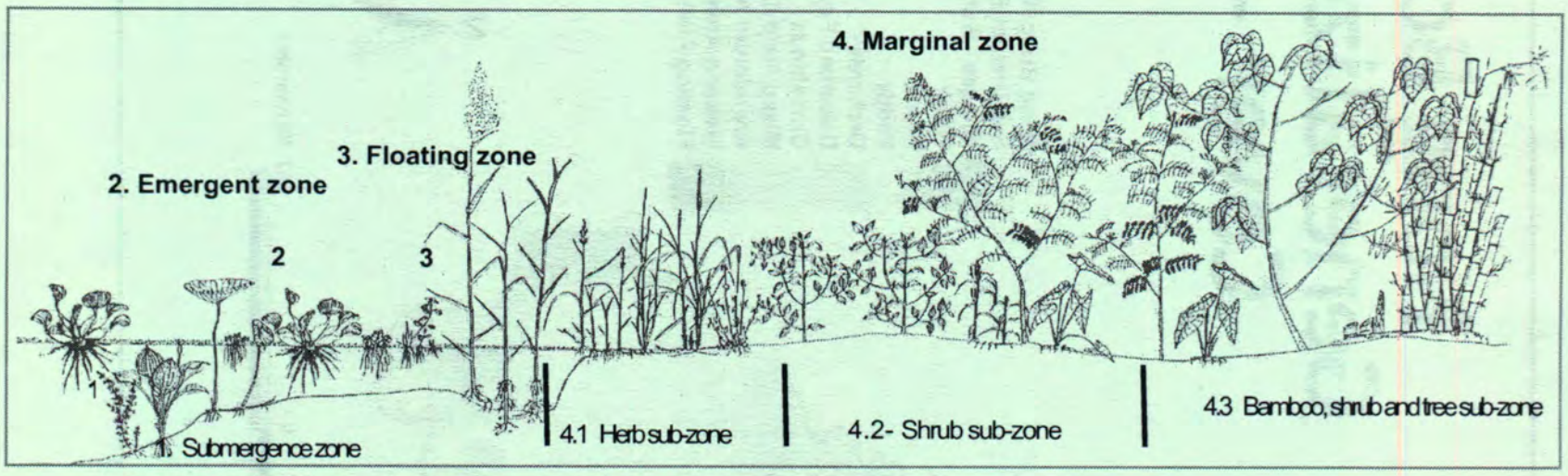


Diagram 1. Wetlands Types – by plant characteristics

During the last 11 years, people have encroached on the open water area of the lake by filling along the shoreline with soil. Nevertheless, the total water area in the 2 tambons has increased by 350 rai as a result of government organizations having constructed reservoirs or ox bow lakes around the villages. Most of plant species that are found in this open water area are floating plants, water hyacinth and water fern. These often clot together into what is locally called "Peung". At this time, the number of these plants is low but if the water quality changes, they may increase and become an important factor for water resources and fishery resources management.

Other aquatic plants such as Gogon grass have similar characteristics as floating plant but are not a floating plant type. These can be found on the clumps of the remains of the true floating plants. If these clumps stick together at the edge of the lake, the lake will become gradually smaller. Shrubs and trees can grow on this material and, eventually, the water area will become land.

In the Submerged Zone, the submerged plants are mostly soft stemmed but they are rarely found. There are a few species: Carolina fanwort, common Hornwort, hydrilla, Duck lettuce, and *Blyxa japonica*.

The Emergent zone is found at the edge of the lake. Plants in this zone may include water primrose, and sacred lotus.

In the Marginal zone or herb zone, most plants can grow at the edge of the lake. This zone divides into 3 sub-zones: Herb sub-zone, where species such as Giant reed, common reed, gogon grass, *Isachne globosa*, Naag rak tung, and *Lindernia anagallis* are found. In the Shrub sub-zone, species such as the Giant Sensitive Plant [*Mimosa*], Pagoda flower, and *Chromolaena odorat* occur. In the sub-zone of Bamboo, shrub and tree, Krathum Raa, Barbate, Cauliforus fig, *Bambusa nutans* [NCN] grow. Over the last 20-30 years, Giant Sensitive Plant, an exotic species that can grow well in wetlands, especially in the drawdown zone, has become a problem for wetland management. It is often found in the Nong Luang area of the wetland complex but it is presently still rare in the Nong Bong Kai catchment.

Photo 2. Mimosa sp. – Giant Sensitive Plant

Wildlife

Fish

Compilation of secondary data and additional studies in the wetland complex area found that there are at least 46 species of fish from 17 families, with 17 species having economic value. The most abundant species found is the banded shark. There are 9 exotic species that have been introduced including the Hybrid Walking Catfish, Indian Barb, Mekong Giant Catfish, Iridescent Shark Catfish, and Giant Snakehead. Five threatened species are important to conservation: Big-head Walking Catfish, Walking Catfish, Siamese Fighting Fish, *B*arb, and Badis. The last species can only be found in Mekong River. There are 15 species that migrate in the rainy season between Nong Bong Kai, Lau River and Mae Kok River, for example the Banded Shark, Black Striped Barb and Tawes from Khong River and Thai Minnow and Walking Catfish from Lua River.

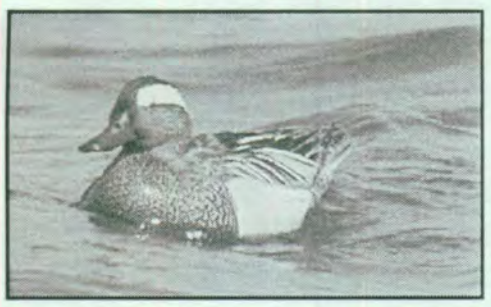
The survey found that fish lay eggs and look after their young in the east end of Nong Bong Kai Lake between Sun Moo Noi Island to the office of the Non-Hunting Area, as this area has been less disturbed and there are abundant aquatic plant communities. The density and distribution of fish change with the season. In the rainy season, the fish distribute themselves throughout Nong Bong Kai Lake but in dry season, the fish gather near the office of the Non-Hunting Area and the weir because the water level of these areas is deeper.

Mammals and Birds:

Wildlife habitat in Nong Bong Kai and nearby areas has been mostly destroyed. This has caused a decrease in the number of wildlife species and now only small animals that can adapt to the changed habitat remain.

However, water resources in Nong Bong Kai Lake and adjacent wetlands are appropriate habitat for migratory birds arriving here to avoid cold and drought in southern China and Siberia. From November to February every year, large numbers of water birds stay and breed in the catchment area and often find food in the villagers' paddy fields.

Photo 3. *Anas querquedula* - Garganey



From literature reviews and a bird survey at Nong Bong Kai Lake and adjacent areas (Marod et al., 2003) it was found that there are at least 225 bird species. These divide into 79 migratory species such as *Anas querquedula*-Garganey; 23 resident breeder species such as *Francolinus pintadeanus*-Chinese Franolin; and 23 migratory / resident breeder species such as *Gallinula chloropus*.

The status of 219 species is protected [97.33 percent] and 19 species are threatened. Five species are recognized to be of international importance: *Aythya nyroca*-White Eyed Pouchard, *Aythya baeri*- Boer's Pouchard , *Vanellus cinereus* Grey Headed Lapwing, *Ixobrychus eurhythmus* -Schrenck's Bittern and *Mycteria leucocephala*- Painted Stork.

Photo 4. *Mycteria leucocephala* - Painted Stork

An additional study was undertaken during December 2003 and February 2004 to determine bird abundance and movement between the 5 important habitat areas: Nong Bong Kai Lake (observed at Sun Moo Noi Island), Jaw Nai Thongdam, Nong Chalab, Nong Luang and Nong Bua. Table 2.

Table 2. Number of water birds and ducks found in important habitats around Nong Bong Kai Lake

Location	Type of habitat	Number of birds	Duck species	Average number of birds/ day
Nong Bong Kai	Deep water (>1.5 m)	10	9	502
Jaw Nai Thongdam	Shallow water (< 0.5 m)	22	6	870
Nong Chalab	Shallow water (< 0.5 m)	12	3	774
Nong Luang	Moderate deep water (0.5-1.5 m)	17	2	390
Nong Bua	Moderate deep water (0.5-1.5 m)	11	2	116

Reference : Marod et al, 2004

The survey found at least 35 bird species, totaling 2652 individuals, of which 11 species were ducks. In Nong Bong Kai Lake, in the area of deep water habitat, 10 bird species and 9 duck species, totaling 502, ducks were counted.

Jaw Nai Thongdam is a wet low-land and muddy, the water depth is less than 0.5 m. This area belongs to private individuals. Now it is paddy field, however it is identified as the most important area for birds because there are 22 bird species and 6 duck species use this area. The average number of birds / day is 870 with the highest numbers of bird in one flock, 250 birds. Buffalo grazing during the day often disturbs the birds in this area, so they fly to Nong Bong Kai.

Nong Chalab is an open wetland, containing several species of lotus and grasses. It is far from Nong Bong Kai about 2.5 km. to the north. The bird survey found 12 bird species and 3 duck species; Lesser Whistling Duck, Garganey and Common Teal. Abundance and density of bird populations is the second highest in the area.

Nong Luang and Nong Bua are moderately deep water areas. Nong Bua was constructed for domestic consumption by the government. Nong Luang Lake was a large natural water source but it has now been invaded by Giant Mimosa, especially in the drawdown area or the area that is less than 0.5 m deep.

The birds found included 17 species but only 1 species of duck, the Lesser Whistling Duck, the same as in Nong Bua. The lack of birds is attributed to buffalo grazing, fishing and community use. Movement observations for 5 days found that they did move between Nong Bong Kai and Nong Luang. (Marod et al., 2004)

Physio-chemical Features

Water samples, in Nong Bong Kai Lake and nearby water sources, were collected for analysis by Suthammawong and Marod et al (2004). The results of the data analysis are summarized as follows;

Water temperature at 20 cm from surface ranges between 28.5 and 30.98 °C. This temperature range is within the standard range of water sources in Thailand - 29 to 31 °C. It does not affect aquatic organisms.

The pH of the water is 6.4 - 9.0, which is lower than the drinking water standard for Thailand. Alkali water is found to the west of Nong Bong Kai and to the east of the Non-Hunting area office. This occurs because the villagers keep animals such as buffalo, pigs and chickens in those areas. The pH of water at the edge of Nong Bong Kai Lake is lower than the pH in open water, due to the oxidation of dead aquatic plants.

Analysis of important nutrients such as dissolved Nitrate (NO_3) 0.00-0.80 mg. /litre and Phosphorus (PO_4) 0.00- 1.00 mg./litre indicate waste water and agriculture chemical contaminations occur in the

area. These quantities are higher than the dissolved Nitrate Standard of surface water and drinking water set at 0.5 mm./liter and 0.45 mm./litre respectively. These readings are in the area near the resorts and orange orchards in the northwest of Nong Bong Kai Lake.

The quantity of dissolved oxygen is between 20.5-32.6 mm. /litre. This has no affect on aquatic animals. The water at the middle of the lake is clearer than in the drawdown zone because it is not disturbed by domestic animals.

Socio-economic Features

The results of the socio-economic survey in 2003 by Suwanarik, et al. (2003) and village census (NRCCD data) in 2004 found that Tambon Yo Nok consists of 11 villages, with 8693 people, 2794 families with an average income of 25,256 Baht/person/year. Tambon Pa Sak consists of 10 villages, with 3777 people and 1024 families. The average income is 23,227 Baht/person/year. The main occupation of people in both tambons is farming, general labour and fishing. People of Doi See Kaew, Doi Jun, Rong Bong, Thung Phaham and Kong Ngam villages have average income of less than 20,000 Baht/person/year, which is less than the poverty line set by the Community Development Department (Table 3).

Table 3. Name of villages, number of families, population, and income -Tambons Pa Sak and Yo Nok

Villages	Number of families		Population			Average income/person /year (Baht)	Distance from village to wetland (km)
	Total	Utilization[2/]	Total	Male	Female		
Tambon Pa Sak							
1. Mae Kham Kaset	121		384	185	199	22,651	5.33
2. Mae Kham Nong Bau	238		711	346	365	22,651	5.07
3. Pa Sak Noi 1/	414	7	1108	538	570	21,062	2.57
4. Pa Dad 1/	162	16	449	207	242	28,203	2.90
5. Nong Bau Sod 1/	218	26	650	303	347	29,129	2.53
6. Pang Mau Poung1/	396	3	1102	538	564	30,973	2.7
7. Doi Champee 1/	304	41	927	447	480	33,378	2.47
8. Doi See Kaew 1/	106	13	302	158	144	13,269	1.75
9. Sun Madet	232		580	280	300	23,482	4.15
10. Doi Kham 1/	120	168	313	163	150	22,344	3.18
11. Mae Kham Tai	201		636	309	327	20,450	2.29
12. Pa Sak Noi	225		854	394	460	29,810	3.19
13. Pa Sak Noi	177		677	346	331	30,931	4.11
Total	**2,794**	**264**	**8,693**	**4,214**	**3,979**	**25,256**	**3.25 (2.58) [3/]**

Village	Number of families		Population			Average income/person /year (Baht)	Distance from village to wetland (km)
	Total	Utilization [2/]	Total	Male	Female		
Tambon Yo Nok							

1. Doi Chan	250		817	399	418	19,166	1.99
2. Rong Bong 1/	140	101	485	224	261	18,876	1.81
3. Koo Tao 1/	143	20	549	267	282	25,697	1.28
4. San That	204		879	438	441	20,221	6.37
5. Thung Phaham	125		488	248	240	18,143	0.82
6. Sun Ton Pao 1/	79	23	283	142	141	30,669	1.78
7. Kong Ngam 1/	62	22	198	102	96	14,855	3.15
8. Doi Ngam 1/	21	18	78	43	35	38,186	1.13
Total	1,024	234	3,777	1863	1914	23,227	2.29 (1.83)3/

Remark:
1/ Villages where people utilize Nong Bong Kai wetland.
2/ Number of families that utilize the wetland
3/Average distance from the village to Nong Bong Kai

Resource Uses

The MPW Project collected socio-economic data in the villages of Tambons Pa Sak and Yo Nok, by Participatory Rural Appraisal for 9 types of land uses of Nong Bong Kai area. (Suwanarik et al, 2003)

In Tambon Pa Sak, 7 of the total of 13 villages in the tambon use resources in the Nong Bong Kai area. [See Table 3]. There are a total of 274 families, or 20 percent of the total families in the tambon, that use resources in Nong Bong Kai Lake and adjacent areas in various forms: gathering bamboo shoots, fishing, renting the land for corn farming, keeping cattle, using water for agriculture, keeping chickens and fish, gardening and gathering Tao (a species of edible seaweed). Gathering bamboo shoots comprises 38 percent of all use types whereas using water for agriculture is less than 5 percent because Tambon Pa Sak is located mostly in the high land, and 40 percent of the area is covered by old clearing and degraded forest. It is far from Nong Bong Kai Lake, about 2.6 km. The village that uses Nong Bong Kai most is Doi Kham where 90% of the families gather bamboo shoots.

In Tambon Yo Nok, 5 villages from a total of 8 have families that use the Nong Bong Kai area resources - a total of 234 families or 53 percent of all the families in the Tambon. There are 2.5 times as many families using the area from Tambon Yo Nok than Tambon Pa Sak. The intensity of resource use, from high to low, is rice farming, fishing, keeping chickens and fish, keeping cattle, gardening, gathering bamboo shoots and Tao. Approximately 65 percent of the total families in Tambon Yo Nok use water for paddy (rice farming). Rong Bong and Doi Jun villages in Tambon Yo Nok have the highest proportion of families, 72 and 85 percent respectively, using the Nong Bong Kai area.

The areas that villagers use for buffalo grazing occur mostly on the north of Nong Bong Kai Lake, near Jaw Nai Thongdam, in the east near roads, and at the pond close to the weir. Observations found that cattle trample lotus and destroy the wetland ecology.

The villagers catch fish in Nong Bong Kai Lake by using various fishing gear. The most commonly used fishing area is found in the western part of the lake. However, fishing also occurs close to the Headquarters of the Non-Hunting Area, even though the superintendent prohibits fishing there, because fish are abundant in that area.

Economic Values

Wetlands provide both direct and indirect economic benefits to communities located adjacent to wetland areas. Jenkarnkit (2004) studied the status and use of resources in Nong Bong Kai and evaluated the economic returns. The results are shown in Table 4.

Table 4. Economic Values of using Nong Bong Kai and adjacent areas

Descriptions	Baht/Year	Percentage
Direct use		
1. Resource uses	3,664,991	23.9
2. Catching fish	3,660,714	23.9
3. Recreation activities	3,410,000	22.2
4. Using areas for agriculture	4,605,445	30.0
5. Using water without agriculture	47,400	0.3
Total	15,388,550	

Source: Jenharnkit 2004

The people living around Nong Bong Kai gather wetland resources such as Tao or seaweed, bamboo shoots and mushrooms in the rainy season, as well as other minor forest products e.g. honey and edible plants. These activities can create a gross income for the communities of about 3,665,000 Baht / year. Furthermore, it was found that the villagers can catch an average 22-93 Kg./family/year, equivalent to a net income of 31,023 Baht/family/year or the net value of about 3,661,000 Baht/year for the Nong Bong Kai Lake fishery.

The water storage in Nong Bong Kai Lake is important for agriculture, for keeping aquatic animals and for domestic consumption. The study found that water from Nong Bing Kai Lake can generate a gross income from rice farming of about 4,163,000 Baht/year; keeping animals 450,000 Baht/year; keeping fish and chickens 4,288,000 Bath/year; fruit tree gardening 46,000 Baht/year; and, crop farming 396,200 Baht/year. Thus, water from the Lake is the source for creating gross incomes from agricultural production totaling 9,343,000 Baht/year. Use of water for consumption found that only Ku Tao village uses the water from Nong Bong Kai Lake with a calculated economic value of 47,400 Baht/year.

Moreover, it was found that Nong Bong Kai Lake is an attractive resource for outdoor recreation, adventure and nature study. About 1300 tourists visit Nong Bong Kai annually and generate income of about 3,410,000 Baht/year. The study found that the value from lodging, food and souvenir services is not yet being distributed into communities.

The indirect values of Nong Bong Kai wetland as bird habitat, food sources of aquatic animals, underground water sources, preventing flood and drought and, building conservation awareness is difficult to evaluate but it is very significant in the 2 sub districts.

Policies and important development projects related to the wetlands

The Cabinet endorsed the draft "Policies, Measures and Action Plans" for wetland management in Thailand, as approved by National Environment Board on 23rd September 1997. The Cabinet Decree agreed that the concerned agencies would accelerate and support the implementation of the wetland management plan in Thailand. As a Contracting Party of the Ramsar Convention, Thailand is working to manage, conserve and reduce the loss of wetlands in the country, as well as the management conflicts between government parties, private individuals and local communities. The "Policies, Measures and Action Plans" for wetland management in Thailand provides a framework to facilitate overall management of wetlands by various agencies, both government and private sector, in Thailand.

Feasibility Study - Inland Container Depot (ICD)

The 8th and 9th National Economic and Social Development Plans identified Chiang Rai Province to be the economic gateway to the neighbouring 4 countries in the Greater Mekong Sub-region. Based on this framework, the Special Area Development and Economic Cooperation with Neighboring Countries Committee and the National Economic and Social Development Board have proposed the establishment of the Industrial Estate and an Inland Container Depot (ICD) to facilitate transportation

and support for 5 industries including: animal food processing, gem and adornments, textile and clothing, household articles and furniture, and electrical appliance and electronics. The Industrial Estate Authority of Thailand was assigned to conduct a feasibility study on suitable locations for the industrial estate and inland container depot (ICD) at Chiang Saen District, Chiang Rai Province.

An Environmental Impact Assessment was to be finished in August 2004 and submitted to the National Environment Board for approval, in December 2004. The duration for construction is about 14 months, from December 2004 to February 2006, and it is expected to open in March 2006.

PART 2. *THE STRATEGY*

Introduction

This Strategic Wetland Management Plan is the result of 2 years work building a strong cadre of capable stakeholders [Project Area Management Team - PAMT] and the technical inputs to help support their planning and decision making process. These precursors to the actual preparation of the Strategy accomplished two things. First, the stakeholders developed a comprehensive understanding of the ecological, administrative, political and economic factors influencing the Nong Bong Kai area. This understanding lead to commitment as demonstrated in the continuing participation of the individuals and groups throughout the process. Secondly, the technical inputs, including a GIS database, and economic and social analyses provided the basis for decision-making and for evaluating the different issue relationships necessary for managing the wetland ecology.

The entire process over the two years was based on Thai strategic planning experience and the New Guidelines for Management Planning for Ramsar sites. The Principles on which the management plan was developed reflect the core concepts of the Ramsar Guidelines, described below, and these were incorporated in both the process and structure of the plan. The stakeholders and the technical support groups applied these Principles throughout the strategic planning process. The Nong Bong Kai Strategic Wetland Management Plan, initially prepared and approved in Thai, has a somewhat different format that meets the government's administrative needs for project development and budgeting, but the concepts, wording and actions defined are the same.

The Principles

The Ramsar Convention's New Guidelines for Management Planning

Resolution VIII.14 of the Ramsar Convention provided the MPW Project with the foundations for preparing the Strategic Wetland Management Plans.

Throughout its recent history, the management emphasis of the Ramsar Convention on Wetlands of International Importance has shifted towards the concepts of wise use and maintenance of the ecological character of wetlands. These concepts underpin the Convention and they provide the basis for ensuring the survival of wildlife species, dependent on wetlands, and for encouraging sustainable human development with respect to the utilization of wetland resources.

The Nong Bong Kai Strategic Wetland Management Plan follows the Conventions definitions.

Resolution VIII.14 comprehensively outlines the concepts of wetland management planning and the necessary steps to achieve sustainability. These include the following core concepts:

The Convention defines "wise use" of wetlands as, "their sustainable utilization for the benefit of human kind in a way compatible with the maintenance of the natural properties of the ecosystem", and "sustainable utilization" as, "human use of a wetland so that it may yield the greatest continuous benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations".

Core Concepts

- Wetland site management needs to be integrated within broad-scale environmental management planning, including river basin and coastal zone management and not be seen as stand alone site planning.
- The need to understand the ten functions of wetland management.
- The need to involve stakeholders, including local communities and indigenous people in the planning process.
- The application of the precautionary approach to environmental (wetland) management
- Understanding that management planning is a continuous, long-term "process" and not an outcome.

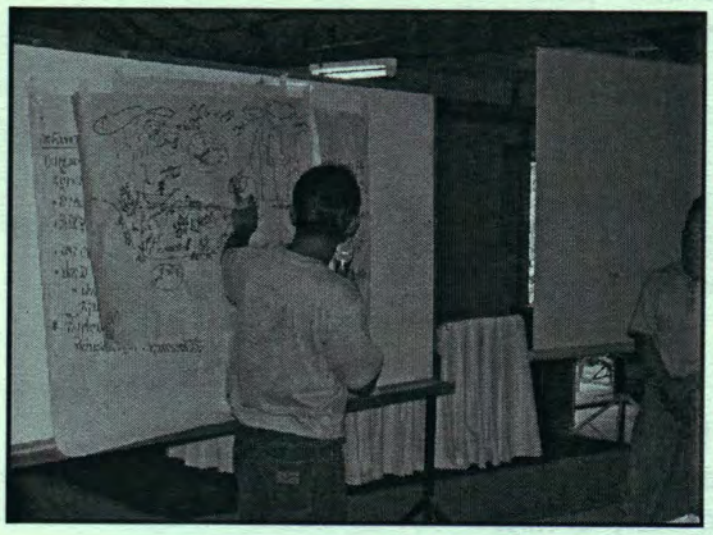
- Managers must differentiate between inputs (resources), outputs (policies, plans and management action) and outcomes (end-state of the ecological character of the wetland and other management objectives).
- The principles of "adaptable management" - managers must adopt a flexible approach that will allow them to respond to the legitimate interests of others, adapt to the ever-changing political climate, accommodate uncertain and variable resources, and survive the vagaries of the natural world.
- Clearly identifying logical and manageable wetland management units, including the need for zonation and buffer zones.
- A comprehensive format for the management plan should comprise five main sections (reflecting the main steps in the management planning process). These are a) Preamble/policy, b) Description, c) Evaluation, d) Objectives, and e) Action Plan.
- With regard to ecological character, Section XIV. Evaluation states that "the important features of the ecological character (habitats, populations, and processes) of a site, as defined by Resolution VII.10, should provide a focus for the planning process". Criteria for evaluating each feature of the ecological character are also provided.

(Ramsar Convention Bureau. 2002. "New Guidelines for Management Planning for Ramsar Sites and Other Wetlands". IUCN-The World Conservation Union, Gland Switzerland)

Vision Statement

The Nong Bong Kai Watershed will be **a sustainable and ecologically balanced ecosystem**. It will have:

- a **wetland environment** that supports diverse bird and fish species
- **high quality water** in the catchment for long term ecological sustainability and use
- a **quality environment to attract tourists** to the ecological resources of the wetland
- a **protected and rehabilitated area used wisely** to sustain the ecological integrity of the catchment and provide quality of life opportunities for the community
- a participative, empowered and environmentally conscious multi-stakeholder group working together to **manage** the catchment area.



Photos 5. Stakeholders involvement in decision making

The following Figure identifies the key issues in the area and the relationships among issues, as seen by the stakeholders. It represents an understanding of the integrated nature of the physical, biological, physio-chemical and, the use and management elements of the wetland.

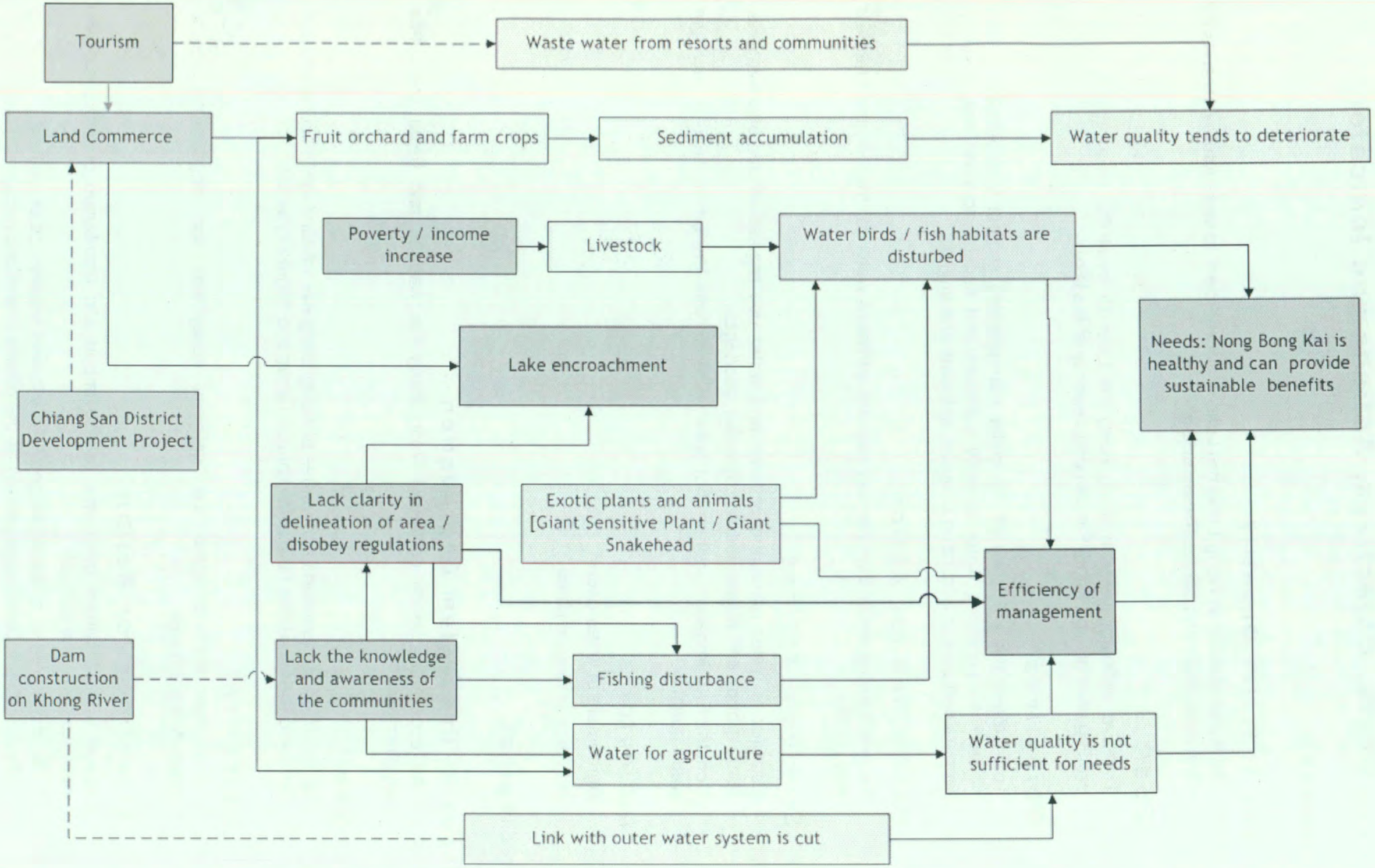


Figure 1. Issues Identified in the Nong Bong Kai Wetlands through Stakeholder Participation

Issues, Goals, Objectives, Actions and Indicators

Physical

Issue 1: Water Quantity

1.1 The water quantity in Nong Bong Kai Lake is not sufficient to meet future demands for local agriculture and domestic consumption.

Goal:

1.1 To have sufficient water in Nong Bong Kai Lake to meet the future needs of the existing user groups within the carrying capacity of the lake.

Objectives:

1.1 To increase the efficiency of the water management system and develop a user network for providing water quantity sufficient and suitable to meet the needs of farmers and people according to areas, activities and timing.

Guidelines for Action

1.1 To manage the water quantity and allocate sufficient water for the needs of farmers and people.

Strategic Actions:

1.1 Establish a water management team and water use regulations for organizations, users groups and others affected by water shortages.

1.2 Construct an irrigation system that links wetlands with the basin areas to increase water quantity.

Indicators:

1.1 Agreement of water users

1.2 Irrigation system in place

Biological

Issue 2: Ecosystem Degradation

2.1 The ecosystem health of the of Nong Bong Kai wetland and basin areas has degenerated.

Goal:

2.1 To maintain the functions and values of Nong Bong Kai wetland and basin areas and preserve its role as the habitat for various fishes and migratory water birds.

Objective:

2.1 To restore and conserve the wetlands ecosystem and degenerated areas surrounding the lake

Guidelines for Action

2.1 To set up appropriate guidelines on the import and distribution of exotic species introduced into the wetland

2.2 To build awareness and knowledge of the use and importance of wetlands, according to the RAMSAR Convention, as well as the effects of wetland ecosystem destruction.

2.3 To restore the ecosystem of the wetland and surrounding areas that have been degenerated or destroyed.

2.4 To decrease soil erosion and protect areas at risk

Strategic Actions:

2.1.1 Set up guidelines on control and monitoring of the Giant Mimosa and Apple Snail distribution.

2.1.2 Provide facilities and produce informative materials about the importance of wetland ecosystems.

2.2.1 Set up curriculum and activities in schools for students to gain basic knowledge about wetland ecosystems.

2.3.1 Set up training courses and demonstration projects to provide opportunities to gain knowledge that leads to wetland conservation by representatives of Local Administration Organizations and various stakeholders.

2.3.2 Set up guidelines for restoring the deteriorated wetland ecosystem and surrounding areas in the catchment.

2.4.1 Plant trees or ground cover to restore the deteriorated forest and risk areas for top soil erosion.

Indicators:

2.1.1 Size of restored wetland

2.2.1 Nature study center and nature interpretation program

2.3.1 Curriculum on wetlands in the school.

2.3.2 Training courses for representatives of local administration organizations and various stakeholders

2.4.1 Size of the restored forest areas around the wetland

Issue 3: Fish Habitat

3.1 Fish habitats in the lake are damaged and threatened by the fishery, and various human activities.

Goal:

3.1 Ecosystem of Nong Bong Kai wetland and basin areas can maintain their values and roles and functions as habitat for migratory water birds and fish.

Objective:

3.1 To conserve the wetland ecosystem and restore degenerated areas surrounding the lake caused by natural events and human activities.

Action Guidelines

3.1 To improve and develop the hydrological connectivity in the Nong Bong Kai wetland, Kok River, Lao River and water sources both inside and outside the basin area.

3.2 To control or decrease the exotic fish species inhabiting and breeding in the wetland.

3.3 To increase the population of native fish species in the wetland

3.4 To preserve and conserve the fish spawning grounds sensitive to disturbance or destruction.

Strategic Actions:

3.1.1 Dredge degenerated and shallow canals in the wetland

3.1.2 Establish hydrological connectivity between the Nong Bong Kai wetland and nearby natural water sources.

3.2.1 Hold an annual activity for communities to catch Giant Snakehead, an exotic species that is decreasing the quantity of native fish

3.3.2 Encourage people to gain awareness and understanding of the effects of releasing exotic fish species into the wetland

3.3.1 Release native fingerlings to increase populations

3.4.1 Formulate measures to preserve and conserve the distinct fish breeding zones that are sensitive to disturbance and destruction

3.4.2 Develop agreement among local fishermen on fishery zones, duration and appropriate size of nets

Indicators:

3.1.1 Water in the canals reaches planned levels

3.1.2 Canals are ecologically linked

3.2.1 The number of people, farmers and youth who join the activities

3.2.2 Public relations signs are set up in clearly visible areas and the annual ceremony of Giant Snakehead eradication is taking place.

3.3.1 The population of native fish species has increased

3.4.1 Fishermen know the sensitive fish breeding areas

3.4.2 Agreement among the fishermen and with other stakeholders

Issue 4: Water Bird Habitats

4.1 Water bird habitats, both inside and out side the Non-Hunting Area, are being disturbed and destroyed by buffalo, and there are also conflicts with fishermen and farmers

Goal

4.1 The ecosystem of Nong Bong Kai wetland and basin areas maintain their functions and values, and role as habitat for migratory water birds

Objective:

4.1 To conserve the wetland ecosystem and restore degenerated areas surrounding the lake caused by natural events and human activities.

Guidelines for Action

4.1 To build awareness and knowledge of water birds and wetland for farmers and youths

4.2 To set up guidelines, locations and appropriate timing among stakeholder groups and officers, for grazing animals

Strategic Actions:

4.1.1 Hold activities for propagating and encouraging farmers and youth to gain knowledge and understanding of water birds and wetlands

4.1.2 Set up boundaries and measures, with the participation of farmers and youths, for conserving water bird resting areas that are sensitive to destruction

4.1.3 Study and evaluate the economic value of damage to paddy grains destroyed by water birds, and set up guidelines and criteria for compensating farmers.

4.2.1 Set up guidelines, boundaries and appropriate timing for grazing animals in the area. Establish agreement among groups keeping buffalo, landowners and officers.

Indicators:

4.1.1 The number of youth, officers and villagers who are trained.

4.1.2 Fishermen and tourists know the sensitive bird habitat.

4.1.3 Reports and recommendations on compensation guidelines are completed.
4.2.1 Agreements on keeping buffalo between animal raisers, landowners and officers

Physio- Chemical

Issue 5: Water Quality

Water quality in Nong Bong Kai wetland trends to be lower than the Thailand standards for drinking and domestic consumption, especially in the areas near Ku Tao Village and communities.

Goal:

5.1 The water quality in Nong Bong Kai lake is higher than the Thailand standards for household consumption and aquatic life.

Objective:

5.1 To decrease the use of chemical substances in agricultural areas, waste deposits and waste water from communities, animal farms and tourist enterprises.

Guidelines for Actions

5.1 To support farmers to be aware of the damage caused by chemical substances and the benefits of biological substance use.

5.2 To manage and control the sources of pollution, waste matter and garbage in the eco-system

5.3 To monitor water quality in the wetland and nearby canals.

Strategic Actions:

5.1.1 Increase farmer's knowledge of the effects of chemical substance use

5.1.2 Increase farmer's knowledge and understanding of the techniques and methods for producing and using biological pest controls and fertilizers

5.2.1 Provide information to communities and tourists, and encourage them to decrease the quantity of waste matter and garbage in Nong Bong Kai wetland and nearby areas.

5.2.2 Set up Tambon Administration Organization measures and regulations to effectively control garbage and waste matter problems

5.3.1 Set up methods and sites for water quality monitoring.

5.3.2 Train village volunteers and community networks to understand and support water quality monitoring

Indicators:

5.1 The farmers using the wetland areas have information and knowledge

5.2 The quantity of waste matter is decreased.

5.3 The people respond positively to the water quality measures and regulations instituted by the Tambon Administration Organizations.

5.4 Number of volunteer and community networks participated in water quality monitoring

Use and Management

Issue 6: Land Development

6.1 Land speculators and investors have invaded the areas around Nong Bong Kai Non-Hunting Area

Goal:

6.1 To have an effective wetland stakeholder management team mechanism that manages the wetland according to the RAMSAR Convention

Objective:

6.1 To strengthen the capacity of officers and communities to efficiently manage and protect the Nong Bong Kai wetland according to RAMSAR Convention

Guidelines for Actions:

6.1 To survey and establish a distinct boundary for the Nong Bong Kai Non-Hunting Area and potential areas to be added in the Non-Hunting Area

6.2 To strengthen the capacity and efficiency Non Hunting Area officers, local administration organizations and communities, to manage the wetlands according to the RAMSAR Convention

Strategic Actions:

6.1.1 Survey and demarcate the distinct boundary of Nong Bong Kai Non-Hunting Area and evaluate potential areas that are appropriate to be additional conservation areas.

6.1.2 Revise the declaration of Nong Bong Kai Non-Hunting Area, with community participation, to establish a distinct boundary

6.2.1 Train officers of the Non-Hunting Area, representatives of the local administration organization and members of the communities, to manage the wetland according to the RAMSAR Convention.

6.2.2 Train community leaders and local administration organization staff to participate in project implementation, monitoring and assessment.

6.2.3 Conduct study tours on wetland management at successful sites in Thailand

6.2.4 Establish a Nong Bong Kai wetland management committee consisting of government agencies, NGOs, local leaders and conservation groups.

6.2 5 Establish a community volunteer group to join with government officers to monitor encroachment, destruction and use of the wetlands and surrounding areas.

Indicators:

6.1.1 A report on the survey and distinct boundary recommendations

6.1.2 The boundary agreement announced by the Ministry

6.2.1 The number of trained officers and villagers

6.2.2 The number of trained community leaders and officers of local administration organizations

6.2.3 The number of officers and villagers that participate in the study tour

6.2.4 The Nong Bong Kai wetland management committee established

6.2.5 The Lake protection volunteer group established

Issue 7: Ecosystem Awareness

7.1 People lack knowledge and understanding of the integrated functions and values of Nong Bong Kai wetland.

Goal:

7.1 Sustainable use of Nong Bong Kai wetland area exists and the benefits are distributed fairly to communities in the wetland areas

Objective:

7.1 To gain knowledge and build awareness by people, farmers and youth about the importance of the ecosystem and use of the wetland and how plant and animal species that should be conserved, according to the RAMSAR Convention.

Guidelines for Action:

7.1 To promote eco-tourism with community participation to strengthen the wetland's value

Strategic Actions:

7.1.1 Survey and develop areas for aquatic plant and animal resources that have high potential as an eco-tourism attraction.

7.1.2 Prepare a public relations plan and promotion brochures on eco-tourism attractions and important tourism activities in the wetlands and surrounding areas.

7.1.3 Train community members and youths to participate in tourism activities for generating additional income.

Indicators:

7.1.1 A report on eco-tourism attractions.

7.1.2 A public relations promotion plan and brochures about eco-tourism attractions

7.1.3 The number of villagers and youths who are trained.

Management Zones

The management zones Nong Bong Kai Ramsar Site and surrounding in two Tambons were delineated according to resource capability and the defined objectives. The zoning scheme fits and utilizes aspects of the approach of the Ramsar Convention, similar wetland projects in Thailand and the on-going land use planning implemented by the Chiang Rai Provincial Declaration on Town and Country Planning.

The stakeholders agreed to structure the plan into 3 main management zones and subdivide them into 8 sub-zones as follows:

1. Wetland Protection Zone

1.1 Protection Zone
1.2 Special Water Bird Conservation Zone
1.3 Water Conservation Zone

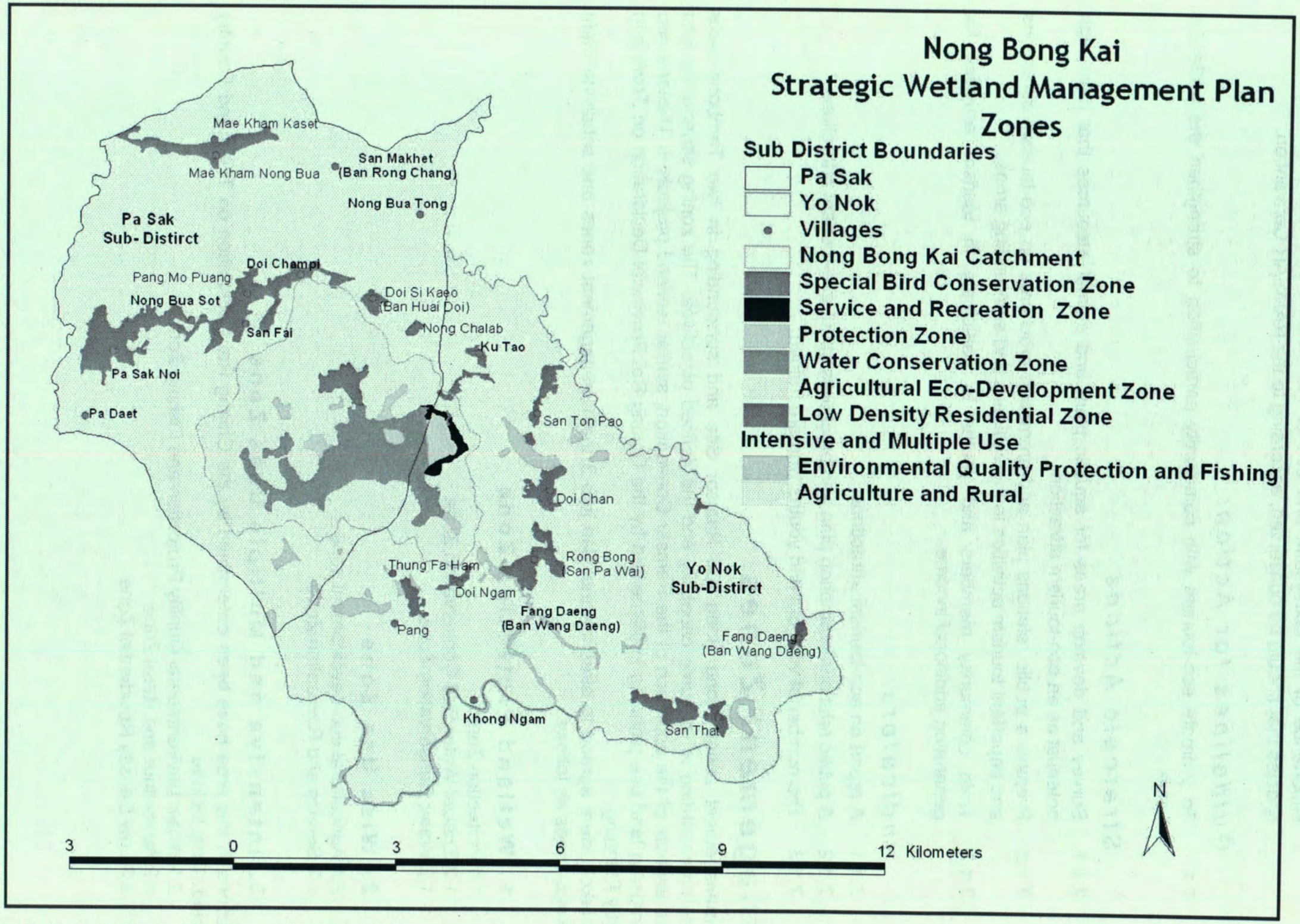
2. Wise Use Zone

2.1 Agricultural eco-development zone
2.2 Service and Recreation Zone

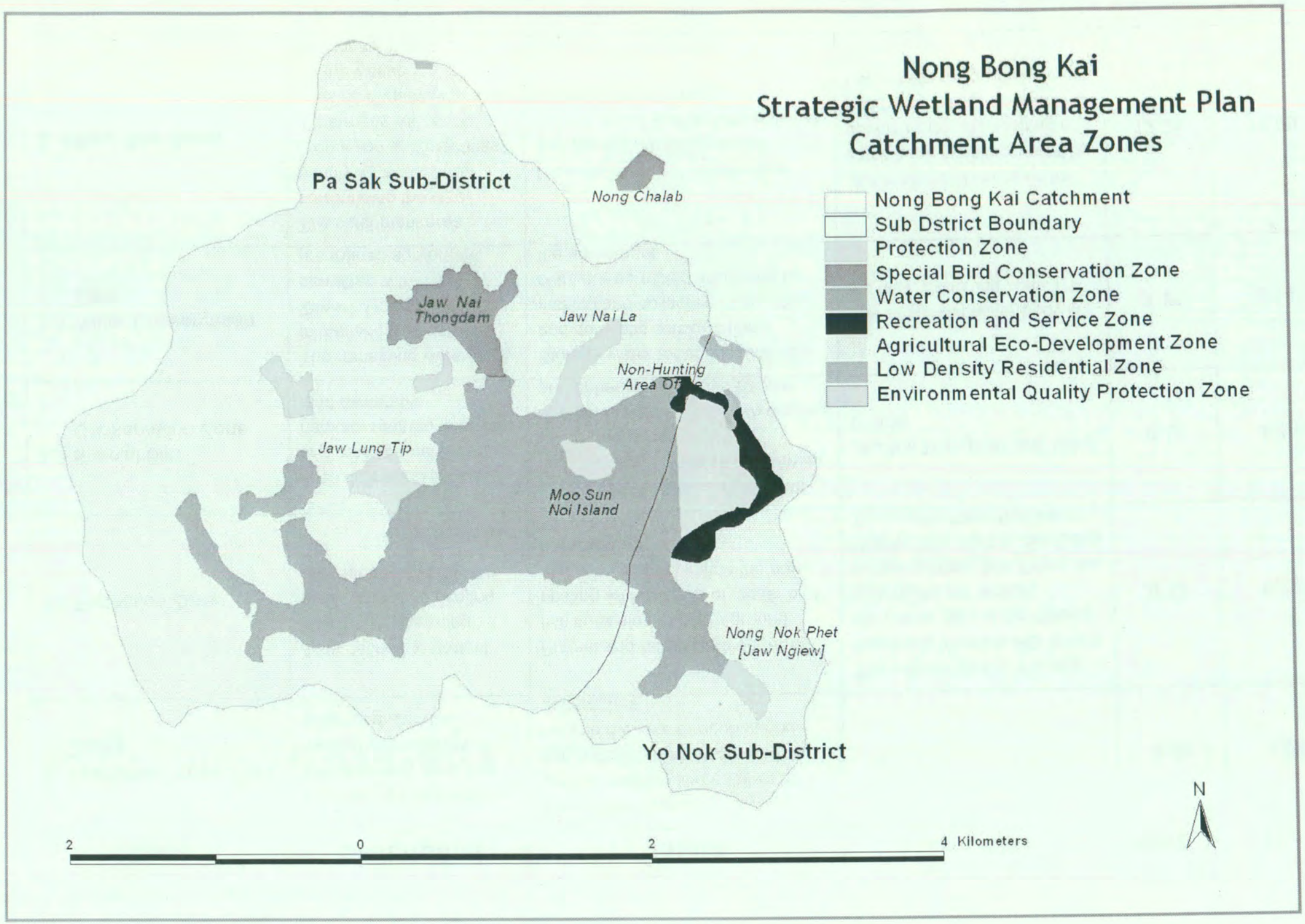
3. Intensive and Multiple Uses Zone

The zones in this area have been determined by the Chiang Rai Declaration on Town and Country Planning. They include:

3.1 Water Environmental Quality Protection and Fishing Zone
3.2 Agriculture and Rural Zone
3.3 Low Density Residential Zone



Map 5. Nong Bong Kai Zoning of Sub Districts



Map 6. Nong Bong Kai - Details of Zoning for Catchment Area

Management Zones and Management Intents

Table 5. Management Zones Intents and Extent

Zone	Description	Intent	Location	Km2 [1/]	(%) [1/]
1. Wetland Protection Zone	Area defined to protect fish spawning area, bird nesting and habitats of water bird and fish	Protect fish spawning, nursery ground, nesting and habitats of bird and fish both inside and outside the lake through various approaches		**4.30**	**4.26**
1.1 Protection Zone	Area defined to protect critical fish spawning area, water bird nesting and habitats of bird and fish	Protect and rehabilitate degraded fish spawning, nursery ground, nesting and habitats of water bird and fish situated inside the non-hunting area	The eastern part of the lake beginning from the HQ toward the pier in front of the Chiang Saen Lake Hill Resort, including Nong Nok Phet [Jaw Ngiew], Jaw Nai La, Jaw Lung Tip and Sun Moo Noi Island	0.73	0.72
1.2 Special Bird Conservation Zone	Area defined to protect and manage water bird habitats situated in private land ownership	Collaborate with grazers and the land owners to develop agreement and/or measures to define appropriate area for buffalo grazing and enhance water bird habitat	Jaw Nai Thongdam and Nong Chalab	0.40	4.40
1.3 Water Conservation Zone	The remaining water body in the lake (exclusive Zone 1.1) ; fishing is permitted within the predefined agreement	Storage water for agricultural use and domestic consumption. Fishing and collection of aquatic plant are permitted according to the agreement	The remaining water body in the lake, excluding zone 1.1	3.17	3.14
2. Wise Use Zone	The catchment area surrounding the lake, mainly for agricultural production and practices in harmony with or not causing negative impacts on the wetland environment	Promote chemical-free fertilizer and pesticide utilization, and nature-based eco-tourism activities in the catchment area	Non-wetland area inside the catchment, mainly covered by upland crops, old clearing and paddy, as well as remnants of low density residential areas	**12.21**	**12.09**

2.1 Agricultural eco-development zone	The catchment area surrounding the lake, mainly for agricultural production in harmony with or not causing negative impacts on the wetland environment	Promote chemical-free fertilizer and pesticide utilization in the catchment area	Non-wetland area inside the catchment, mainly covered by upland crops, old clearing and paddy	11.97	11.86
2.2 Service and Recreation Zone	Area defined for nature education and nature-based tourism activity	Promote and develop limited infrastructure and facilities to support outdoor recreation activities and the study of wetland functions and values	Narrow strip area around the lake starting from the HQ to the shelter in front the Chiang Saen Lake Hill Resort	0.24	0.24
3. Intensive and Multiple Uses Zone	Area located outside the Nong Bong Kai catchment; it covers the remaining area of Tambons Pa Sak and Yo Nok	Management of this zone follows guidelines provided by the Chiang Rai Country and Town Planning Department which is formulating an Urban and Rural Land Use Plan	The remaining areas of Tambons Pa Sak and Yo Nok situated outside the Nong Bong Kai catchment	**84.44**	**83.65**
3.1 Environmental Quality Protection and Fishing Zone	Follows CTP	Follows CTP	Follows CTP	2.35	2.33
3.2 Agriculture and Rural Zone	Follows CTP	Follows CTP	Follows CTP	76.88	76.16
3.3 Low Density Residential Zone	Follows CTP	Follows CTP	Follows CTP	5.21	5.16
Total				**100.95**	**100.0**

1/ Calculated by GIS; 2/ Chiang Rai Department of Country and Town Planning [CTP]

Activities	Wetland Protection Zones			Production Zones		Guidelines
	Protection	Special Bird Conservation	Water Conservation	Service & Recreation	Agriculture & Eco-development	
Paddy	❑	∞	❑	❑	∞	No use of chemical fertilizers or pesticides
Aquatic plant production	⊗	❑	✓	❑	❑	
Bamboo	❑	❑	❑	❑	✓	
Poultry farming	⊗	❑	⊗	⊗	✓	
Grazing	⊗	∞	❑	∞	✓	Follow the defined agreement on grazing areas and timing limitations
Fish ponds	⊗	⊗	∞	⊗	✓	No transfer of carnivores from ponds to lake
Orchards	❑	❑	❑	∞	∞	Encourage use of organic fertilizers and pesticides
Fishing	⊗	⊗	∞	❑	❑	Follow the define agreements for fishing
Upland cash crops	❑	❑	❑	∞	∞	Encourage use of organic fertilizers and pesticides
Building / housing	❑	❑	❑	∞	∞	No waste water drainage or garbage to lake Follow regulations of OBT
Resort	⊗	⊗	❑	∞	∞	
Infrastructure for recreation / tourism	⊗	⊗	⊗	∞	∞	No waste water drainage to lake
Pier	∞	❑	∞	❑	❑	Limit number & distribution of piers. Must prove no damage to spawning
Bird watching / water sports	∞	∞	✓	✓	✓	No motorized boats except for management

Table 6. Table of Compatible Activities for Nong Bong Kai Catchment Area [See Map 6]

✓	**COMPATIBLE USE**	Uses that are considered compatible with the management intent of the land use zone under normal guidelines and existing regulations.
∞	**CONDITIONAL USE**	Uses that may be compatible with the intent of the land use zone under circumstances and under special conditions and controls.
⊗	**NOT PERMITTED USE**	Uses that are not compatible with the intent or capabilities of the land use zone.
❑	**NOT APPLICABLE**	These activities do not occur in the land use zone

PART 3. *IMPLEMENTATION PLAN*

The Nong Bong Kai Strategic Wetland Management Plan has a 20-year time horizon, 2004 to 2024. This Implementation Plan or Operational Plan firstly defines the projects, at the conceptual level, that will be undertaken over the next five years 2004 – 2008. Annex 2 presents the project definitions and shows the links to the objectives and strategic actions, the estimated budgets, the organizations proposing the budget, and the locations where they will focus implementation.

Project and Budget Summary

According to the results of the workshops to formulate the Nong Bong Kai wetland management strategy (Annex 4), and meetings with the planning officers from central, regional and local government organizations, 45 project concepts have been identified with budgets totaling 46.55 million Baht. These are summarized as follows:

- The 1st year (2004) proposed 13 projects, budget 1,000,000 Baht ($25,000 U.S.)
- The 2nd year (2005) proposed 39 projects, budget 13,620,000 Baht ($340,000 U.S.)
- The 3rd year (2006) proposed 35 projects, budget 26,350,000 Baht ($658,750 U.S.)
- The 4th year (2007) proposed 33 projects, budget 3,160,000 Baht ($79,000 U.S.)
- The 5th year (2008) proposed 25 projects, budget 2,420,000 Baht ($60,500 U.S.)

In Appendix 2 the 45 project concepts and budget estimates are described in detail. It is shown that some projects will be implemented completely in 1 year and some projects must be implemented over 4 - 5 years. These will involve many budget: sources, from local administration organizations (Chiang Rai Provincial Administration Organization, Yo Nok Tambon Administration Organization, Pa Sak Administration Organization), Government agencies at the provincial level, Government agencies from the central, and the MPW Project, which allocates budget from the Wetland Conservation and Rehabilitation Fund: WCRF (Local Initiative Fund) and their local programme budget.

There are 8 large projects that will require budgets of over 1 million Baht:

- the water gate irrigation canals improvement projects (2 projects) (20 million baht: water gate 10 million and irrigation canals 10 million Baht);
- the establishment of nature study center and nature interpretation programs for Nong Bong Kai wetland area project (5.9 million Baht);
- the improving of landscape around the lake for promoting ecotourism (6 million Baht);
- the planting of aquatic plants to recover Nong Bong Kai ecosystem (2 million Baht);
- the planting of trees to recover the degenerated areas that are at risk to soil erosion (2 projects) (1.2 million Baht each); and,
- the dredging the natural canals for making link of water system (1 million Baht).

The remaining 37 projects are small budget projects that emphasize building awareness, training and providing opportunities for increasing knowledge and understanding about the sustainable use and conservation of the Nong Bong Kai wetland.

Implementation of the Strategic Plan

The projects [Appendix 2] include details about the strategic actions [these are identified in the table in Appendix 1 and are the link between the Objectives and their monitoring indicators through the Projects], the project concept / description, budget, timing, responsible delivery organizations, and target zones or areas for the project.

In cases where budgets are limited, the working planning team, or the PAMT, will set project priorities by considering various criteria as exemplified in the project – Water Quality Monitoring and Assessment in Nong Bong Kai Non-Hunting Area described in Appendix 3.

It was recognized that for the Strategy to be applied effectively and understood by the organizations responsible for delivery, the Chiang Rai Provincial Office issued order No. 1820/2547 on July 28th, 2004 appointing a Project Screening and Budget Requisition Working Group. The responsibilities of the team are detailed in Appendix 4.

The Office of Natural Resources and Environment Policy and Planning, and the MPW Project coordinates with Chiang Rai Province to formulate the steps and methods for preparing a working coordination plan.

Training of related officers and stakeholders

The Chiang Rai Provincial Office is experienced in plan formulation and will be the plan coordination organization. The MPW Project will allocate budget and provide technical assistance to Chiang Rai Provincial Office for training the related officers and stakeholders. These will include: the chief of Nong Bong Kai Non-Hunting Area, the assistant Tambon Administrative Organization officers of Pa Sak and Yo Nok, representatives of related government organizations, and the leaders of communities. The main contents of training will consist of verification of the relationship between Nong Bong Kai Wetland Strategic Management Plan and the roles of organizations and, the processes to specifically define the projects including detailing the project objectives, the organizations responsibilities, the budget, the duration of the project, and the expected results and indicators.

Formulation of plans, projects and activities

The representatives of organizations, institutes and community leaders, formulate plans, projects and activities based on the principal of Area-Function-Participation. All stakeholder groups join to prepare and implement the projects in the target areas that will achieve the Objectives and are compatible with management zones agreed to by the Working Planning Team.

The plans projects and activities can be divided by the organization responsibilities:

- The MPW Project will fund the urgent projects that need to be implemented in 2004 – 2005, and the small projects that focus on building awareness of wetland conservation and wise use.
- Provincial and Tambon Administration Organizations, Pa Sak and Yo Nok Tambon Administration Organizations consider the small projects which will be done in the respective areas and have importance to quality of life and environment benefits in the communities. The projects can start in 2005. The Provincial Administration Organizations considers the large projects related to activities of ecotourism that can increase incomes in the area and bring recognition to the province.
- The provincial offices such as the provincial irrigation office, the provincial land development office, the provincial natural resources and environment office consider the larger projects that exceed the ability of local administration organization and, where the implementation affects large areas in the Districts or Province such as the irrigation system development project.
- The central organizations such as the National Park, Wildlife and Plant Conservation Department, Office of Natural Resources and Environment Policy and Planning consider the projects related to protecting and conserving wetlands through legal frameworks for instance the surveying and demarcating the Non Hunting Area Boundary and, the projects related to needs for advanced studies and research to be done by the experts.

Budget Requisition for Implementing Plans, Projects and Activities

Plan, projects and activities that require budget from MPW Project must be submitted to Chiang Rai Provincial Project Director and PAMT to consider and approve. The MPW Project transfers the budget to the Chiang Rai Provincial Project Director for implementation of the approved projects. Projects and activities to be funded by local governments, such as Provincial Administration Organization and Tambon Administration Organizations, should be submitted directly to the appropriate offices. The remaining plans and projects should be submitted to the Provincial Development Committee to be included in the provincial development plan or appropriate central organizations for consideration.

Monitoring and assessment

Monitoring and assessment are important steps for the Nong Bong Kai Strategic Wetland Management Plan. These steps provide the information to determine if the implementation actions planned for each project have been carried out during the previous time period and achieved concrete results according to the indicators. This can lead to adjusting the approaches taken to carry out the projects or management activities. Moreover it is a tool for enhancing the effectiveness of wetland management by building understanding and support from the communities, responsible organizations and persons or organizations that formulate policy.

Types of monitoring and assessment

The monitoring and assessment of ***Nong Bong Kai Strategic Wetland Management Plan*** can be divided into 3 levels.

1) Monitoring and assessment on the progress of the application of the Strategy
2) Monitoring and assessment of the progress of projects
3) Monitoring and assessment of the perceptions and attitudes of stakeholders to the strategy and the actual changes in the status of the wetland ecosystem and environment.

The overall purpose of monitoring and assessment on the progress of the application of the strategy is to determine whether or not implementation is consistent with the visions, goals, and objectives of ***Nong Bong Kai Strategic Wetland Management Plan***.

The purpose of monitoring and assessment on the progress of projects is to determine whether the implementation of projects follows the guidelines of wetland management, that the budget and personnel are allocated according to the design of the project and that the project's duration is consistent with the plan.

The purpose of monitoring and assessment on the acceptance of stakeholders to the Strategy is to know the changes in stakeholders' attitudes and behaviour regarding resource use and management in wetland. An additional aspect of this level is monitoring of the ecosystem and environment changes subsequent to implementing the various projects. The monitoring and assessment at this level will be done after the projects are implemented for an appropriate time as it is recognized that the stakeholder's attitudes and the status of the ecosystem will change gradually. MPW project plans to implement this level in 2006.

Tools for monitoring and assessment.

Mid-year Progress Report

The Mid-year Progress Report indicates whether or not the project implementation is consistent with the objectives specified in the Strategy. PAMT can study the information and the results of the first half year and use the information to improve the implementation during the second half of the year. The information in the report may be the quantitative or qualitative.

Verification of Implementation

After Chiang Rai Province verifies the mid year progress report, the working team can provide more inputs to verify additional issues. For the verification, Chiang Rai Province may also study other documents apart from the progress report to verify implementation is taking place according to direction.

Field Visits and Studies

Field studies should be done for the progress report verification. During the field study, the person who carries out the assessment can verify and check the actual implementation, and have a chance to meet the related organizations and people to strengthen coordination.

Project Budget Monitoring

PAMT should examine the projects' budget twice a year (for the projects that are under the support of the MPW Project). The method outlined helps the PAMT track the project budgets in terms how the budgets are being used and what remains in the budget. After examining the budget, PAMT should submit the report together with suggestions of implementation improvements to the Province so the project auditor can examine the budget for the next time period.

Project Implementation Monitoring and Assessment Report

PAMT should submit to the Provincial Governor a Monitoring and Assessment report which would include recommendations for improving project implementation. The person, who carries out the assessment, and the person/organizations assessed, should advise the PAMT on the recommendations in the report.

Appendix 1.

Table Linking the Issues to Goals, Objectives, Guidelines, Strategic Actions and Indicators

Physical -- Water Quantity Issue

Issues	Goals	Objectives	Guidelines for Actions	Strategic Actions	Indicators
1. The quantity of water in Nong Bong Kai Lake is not sufficient to meet the future needs of agriculture and domestic consumption.	1.1. To have enough water in Nong Bong Kai Lake to meet the future needs of the existing user groups within the carrying capacity of the lake.	1.1. To increase the efficiency of the water management system and develop a user network for providing the water quantity sufficient and suitable to meet the needs of farmers and people according to areas, activities and timing.	1.1 To manage the water quantity and allocate sufficient water for the needs of farmers and people.	1.1.1 To establish a water management team and water use regulations for organizations, user groups and others affected by water shortages.	Agreement of water users
				1.1.2. To construct an irrigation system that links wetlands with the basin areas to increase water quantity.	Irrigation system in place

Biological -- Ecosystem Degradation Issue

Issues	Goals	Objectives	Guidelines for Actions	Strategic Actions	Indicators
2. The ecosystem health of the of Nong Bong Kai wetland and basin areas is degenerated.	2.1. To maintain the Nong Bong Kai wetland and basin area ecosystem functions and values, as well as its role as habitat for fish and various migratory water birds	2.1. To conserve and restore the ecosystem of wetlands and degenerated areas surrounding the lake.	2.1. To set up appropriate guidelines on import and distribution of exotic species used in wetland	2.1.1. To set up guideline on control and monitoring of Giant Mimosa plant and Apple Snail distribution.	Size of restored wetland
			2.2 To build awareness and knowledge of the use and importance of wetlands according to RAMSAR convention as well as the effects of wetland ecosystem destruction.	2.2.1. To provide the facilities and produce public relation materials about the importance of wetland ecosystems.	Nature study center and nature interpretation program.
				2.2.2 To set up curriculum and activities in schools for students gain basic knowledge about wetland ecosystems.	Curriculum on wetlands in the schools.
				2.2 3To set up the training courses and demonstration projects to provide opportunities to gain knowledge to lead to wetland conservation by representatives of Local Administration Organizations and various societies.	Training courses for representatives of local administration organizations and various societies.
			2.3 To restore the ecosystem of the wetland and surrounding areas that have been degenerated or destroyed.	2.3.1. To set up guidelines for restoring the deteriorated wetland ecosystem and surrounding areas in the catchment.	Size of restored wetland
			2.4. To decrease soil erosion and protect areas at risk	2.4.1. To plant trees or covering plants to restore the deteriorated forest and risk areas for top soil erosion	Size of the restored forest areas around the wetland.

Biological -- Fish Habitat Issue

Issues	Goals	Objectives	Guidelines for Actions	Strategic Actions	Indicators
3. Fish habitat in the lake are damaged and threatened by fisheries, and various human activities.	3.1. Ecosystem of Nong Bong Kai wetland and basin areas can maintain their values and roles and function as a habitat for migratory water birds and fish.	3.1. To conserve the wetland ecosystem and restore degenerated areas surrounding the lake caused by natural events and human activities.	3.1. To improve and develop the hydrological connectivity in the Nong Bong Kai wetland, Kok River, Lao River and water sources both inside and outside the basin area.	3.1.1. To dredge degenerated and shallow canals in the wetland	Water in the canals reaches planned levels
				3.1.2. To establish the water network among Nong Bong Kai wetland and nearby natural water sources.	The linkage of the canals
			3.2. To control or decrease the exotic species of fish inhabiting and breeding in the wetland.	3.2.1. To hold the annual activity for communities to catch Giant Snakehead, an exotic species that is decreasing the quantity of fish	The number of people, farmers and youth who join the activities.
				3.2.2. To encourage people to gain awareness and understanding of the effects of releasing exotic fish species into wetland.	The public relation signs are set up in clearly visible areas and the annual ceremony of Giant snakehead eradication is taking place.
			3.3. To increase the population of native fish species in the wetland	3.3.1. To release native fingerlings to increase populations.	The population of native fish species has increased.
			3.4. To preserve and conserve the fish spawning grounds sensitive to disturbance or destruction.	3.4.1. To stipulate measures of preserving and conserving the distinct fish breeding zones which are sensitive to disturbance.	Fishermen know the sensitive fish breeding areas.
				3.4.2. To gain agreement on fishery zones, duration and appropriate size of nets with the fishermen.	Agreement with the fishermen.

Biological -- Water Bird Habitat Issue

Issues	Goals	Objectives	Guidelines for Actions	Strategic Actions	Indicators
4. Habitats of water birds both inside and out side the Non-Hunting Area are disturbed and destroyed by buffalo and, there are the conflicts between the fisheries and farmers	4.1. Ecosystem of Nong Bong Kai wetland and basin areas can maintain their values and roles and function as a habitat for migratory water birds.	4.1. To conserve the wetland ecosystem and restore degenerated areas surrounding the lake caused by natural events and human development activities.	4.1. To build awareness and knowledge of water birds and wetland for farmers and youth.	4.1.1 To hold the activities for propagating and encouraging farmers and youth to gain knowledge and understanding of water birds and wetland.	The number of youth, officers and villagers who are trained.
				4.1.2. To set up the boundary and measures on conserving the water birds' resting areas which are sensitive to destruction with the participation of farmers and youth.	Fishermen and tourists know the sensitive habitat of birds.
				4.1.3. To study and evaluate the economic value of damage to paddy grains destroyed by water birds and set up the guidelines and criteria for compensation for farmers.	Reports and recommendations on compensation guidelines are completed.
			4.2 To set up the guidelines, locations and appropriate timing for animal keeping between groups keeping buffalo and officers.	4.2.1. To set up the guidelines, boundary and appropriate timing for keeping animals in the areas. It is an agreement of groups keeping buffalo, land owners and officers.	Agreement among animal raisers, landowners and officers on keeping animals.

Physio-Chemical -- Water Quality Issue

Issues	Goals	Objectives	Guidelines for Actions	Strategic Actions	Indicators
5. Water quality in Nong Bong Kai wetland trends to have lower values than the Thailand standards for drinking water and domestic consumption, especially in the areas near Ku Tao Village and communities.	5 1. The water quality in Nong Bong Kai lake is higher than the Thailand standards for household consumption and aquatic life.	5.1. To decrease use of chemical substances in agricultural areas, waste deposit and waste water from communities, animal farms and tourist enterprises.	5.1. To support the farmers know the damage caused by chemical substances and the benefits of biological substance utilization	5.1.1. To support farmers know the damage and effect of herbicide	The farmers using the wetland areas have knowledge and information.
				5.1.2. To support the farmers know and understand the technique and methods of using and producing biological herbicide and fertilization in the community.	
			5.2 To manage and control source of pollution, waste matter and garbage in system	5.2.1. To encourage and propagate information to the communities and tourists to decrease quantity of waste matter and garbage in Nong Bong Kai wetland and nearby areas.	The quantity of waste matter is decreased.
				5.2.2. T o set up the Tambon Administration Organization measure and regulation on control of effective and systematic garbage and waste matter eradication.	The people respond positively to the water quality measures and regulations instituted by the Tambon Administration Organizations.
			5.3. To monitor the water quality in wetland and nearby canals.	5.3.1. To set up method and site of water specimen collection for water quality monitoring.	Number of volunteer and community networks participated in water quality monitoring
				5.3.2. To hold the training for village volunteers and community network have knowledge and ability to support water quality monitoring implementation	

Use and Management -- Land Development and Management Issue

Issues	Goals	Objectives	Guidelines for Actions	Strategic Actions	Indicators
6. Land speculators and investors have invaded the areas around Nong Bong Kai Non-Hunting Area	6.1. To have an effective management team mechanism that consists of stakeholders who manage wetlands according to RAMSAR Convention	6.1. To strengthen the efficiency of protection and management and, develop the capacity of officers and communities to participate in Nong Bong Kai wetland management according to RAMSAR Convention.	6.1. To survey and set up a distinct boundary of the Nong Bong Kai Non-Hunting Area and potential areas to be added in the Non-Hunting Area.	6.1.1. To survey and demarcate the distinct boundary of Nong Bong Kai Non-Hunting Area and evaluate potential areas which are appropriate to be additional conserved areas.	The report on the survey and boundary recommendations.
				6.1.2. To revise the declaration of Nong Bong Kai Non-Hunting Area, with the community participation, provide a distinct boundary consistent with the current situation	Agreement and announcement of Ministry.
			6.2 To strengthen wetland management efficiency and the potential of officers of the Non Hunting area, local administration organizations and communities, according to RAMSAR Convention	6.2.1. To hold training to gain knowledge of wetland management for officers of Non-Hunting Area, local administration organization and community, according to the RAMSAR Convention.	The number of officers and villagers who are trained.
				6.2.2. To hold training for community leaders and local administration organizations for participating in project implementation and assessment.	The number of community leaders and officers of local administration organization who are trained.
				6.2.3. To hold study tours on wetland management at the successful sites in Thailand.	The number of officers and villagers who participate in the study tour.

Issues	Goals	Objectives	Guidelines for Actions	Strategic Actions	Indicators
				6.2.4. To establish Nong Bong Kai wetland management committee that consists of government agency, NGOs, local leaders and conservation group.	Nong Bong Kai wetland management committee established
				6.2 5. To establish community volunteer group to join with the officers for monitoring encroachment, destruction and use of wetlands and the surrounding areas.	Lake protection volunteer group established

Use and Management -- Ecosystem Awareness Issue

Issues	Goals	Objectives	Guidelines for Actions	Strategic Actions	Indicators
7. People lack knowledge and understanding of the integrated functions and values of Nong Bong Kai wetland.	7.1. Sustainable use of Nong Bong Kai wetland area exists occurring and the benefits are distributed fairly to communities in the wetland areas .	7.1. To build knowledge and awareness among local people, farmers and youth about the importance and wise use of the wetland ecosystem, and how plant and animal species should be conserved, according to the RAMSAR Convention.	7.1. To promote ecotourism with community participation to strengthen wetland values.	7.1.1. To survey and develop areas and aquatic plant and animal resources that have high potential as an ecotourism attraction.	A report on ecotourism attractions.
				7.1.2. To make a plan for public relations and promotion brochures on ecotourism attractions and the important tourism activities in the wetlands and surrounding areas.	A public relations promotion plan and brochures about ecotourism attractions
				7.1.3. To hold training for communities and youth to participate in tourism activities for generating additional income	The number of villagers and youth who are trained.

Appendix 2.

Table Linking Strategic Actions, Projects, Budget and Responsibilities

Physical -- Water Quantity Projects

Strategic Actions	Project Description	Year					Total Budget (Baht)	Responsible Organization	Target areas
		2004	2005	2006	2007	2008			
1.1.1. To establish water management team and water use regulations for organizations, users groups and others affected by water shortages.	1. Establish registration and monitoring systems for water allocation in Tambons Yo Nok and Pa Sak	20,000	50,000	50,000	50,000	50,000	220,000	Yo Nok and Pa Sak Tambon Administration Organizations, ONEP /MPW, Non Hunting Area	2 Tambons
	2. Prepare guidelines for water allocation and, irrigation maintenance, protection and efficiency enhancement.	-	30,000	30,000	30,000	30,000	120,000		
1.1.2. To construct an irrigation system that links wetlands with the basin areas to increase water quantity.	3. Conduct a feasibility study to assess possibility of raising the weir to increase the water quantity.	-	500,000	-	-	-	500,000	Chiang Rai Provincial Irrigation Office	Nong Bong Kai Lake
	4. Improve the Watergate and irrigation canals.	-	-	20 million	-	-	20 million		Nong Bong Kai Lake, Agricultural areas.

Biological -- Ecosystem Degradation Projects

Strategic Actions	Projects	Year					Total Budget (Baht)	Responsible Organization	Target areas
		2004	2005	2006	2007	2008			
2.1.1. To set up guideline on control and monitoring of Giant Mimosa and Apple Snail distribution.	5. Eliminate Apple Snail and Giant Mimosa through stakeholder participation.	-	200,000	200,000	200,000	200,000	800,000	ONEP /MPW, Chiang Rai Provincial Natural Resources and Environment Office	Nong Bong Kai wetland area and nearby areas.
2.2.1. To provide the facilities and produce public relation materials about the importance of wetland ecosystems.	6. Establish the Nature Study Center and a nature interpretation program.	-	5,000,000	300,000	300,000	300,000	5,900,000	Non-Hunting Area, Chiang Rai Provincial Natural Resources and Environment Office, ONEP, Chiang Rai Provincial Office	The Non Hunting Area office
	7. Prepare public relations material, media production and a Broadcasting house for propagating knowledge of the importance and value of Nong Bong Kai ecosystem	150,000	100,000	100,000	100,000	100,000	290,000	ONEP /MPW, Non-Hunting Area, Yo Nok and Pa Sak Tambon Administration Organization, Chiang Rai Provincial Office	Chiang San District.
2.2.1. To set up curriculum and activities for students to gain basic knowledge about wetland ecosystems.	8. Develop courses, provide equipment and train to build awareness of wetland ecosystem values for children and youth	200,000	100,000	100,000	100,000	100,000	600,000	ONEP /MPW, Chiang Rai Provincial Primary Education Office, Wetlands International	Communities and schools in Chiang Rai Province

Strategic Actions	Projects	Year					Total Budget (Baht)	Responsible Organization	Target areas
		2004	2005	2006	2007	2008			
2.2.3. To set up the training courses and demonstration projects to provide opportunities to gain knowledge to lead to wetland conservation by representatives of Local Administration Organizations and various societies.	9. Train representatives of local administration organizations, leaders of communities and groups about wetland conservation.	-	100,000	100,000	100,000	100,000	400,000	ONEP /MPW Chiang Rai Natural Resources and Environment Office	The related officers
2.3.1. To set up guidelines for restoring the deteriorated wetland ecosystem and surrounding areas in the catchment.	10. Develop demonstration plots of wetland wise use.	-	200,000	-	200,000	-	400,000	Non–Hunting Area, Chiang Rai Provincial Fishery Office, Chiang Rai Provincial Agriculture Extension Office, Chiang Rai Provincial Land Development Office	2 Tambon
2.4.1. To plant trees or covering plants to restore degenerated forest and slope areas that lack covering plants and are at risk to soil erosion.	12. Plating trees to restore degenerated areas and that risk soil erosion	-	300,000	300,000	300,000	300,000	1,200,000	Non-Hunting Area, Chiang Rai Provincial Natural Resources and Environment Office	Slope areas around Nong Bong Kai wetland.

Biological -- Fish Habitat Projects

Strategic Actions	Projects	Year					Total Budget (Baht)	Responsible Organization	Target areas
		2004	2005	2006	2007	2008			
3.1.1. To dredge degenerated and shallow canals in the wetland	13. Study the possibility of dredging the natural canals to link the water system.	-	500,000	-	-	-	500,000	Chiang Rai Provincial Natural Resources and Environment Office	Nong Bong Kai Wetland Area
3.1.2. To establish hydrological connectivity among Nong Bong Kai wetland and nearby natural water sources.	14. Dredge the natural canals or build the linkage canals following the study results.	-	-	1 million	-	-	1 million		
3.2.1. To hold the annual activity for communities to catch Giant Snakehead, an exotic species that is decreasing the quantity of fish.	15. Establish Snakehead mullets day for eliminating the exotic fish.	-	50,000	50,000	50,000	50,000	200,000	ONEP /MPW Yo Nok and Pa Sak Administration Organization	Nong Bong Kai Non-Hunting Area
3.3.2. To encourage people to gain awareness and understanding of the effects of releasing exotic fish species into wetland.	16. Produce signs to publicize the exotic plant and animals elimination needs in Nong Bong Kai wetland area.	-	20,000	20,000	20,000	20,000	80,000	Yo Nok and Pa Sak Tambon Administration Organizations	Around Nong Bong Kai area
3.3.1. To release native fingerlings	17. Increase the fishery products from Nong Bong	-	100,000	100,000	100,000	100,000	400,000	Chiang Rai Provincial Fishery Office	Nong Bong Kai wetland area

Strategic Actions	Projects	Year					Total Budget (Baht)	Responsible Organization	Target areas
		2004	2005	2006	2007	2008			
to increase populations.	Kai lake.								
3.4.1. To formulate measures of preserving and conserving the distinct fish breeding zones which are sensitive to disturbance and destruction.	18. Survey the boundary and produce boundary signs for the reserved zones in Nong Bong Kai lake.	-	20,000	10,000	10,000	10,000	50,000	Yo Nok and Pa Sak Tambon Administration Organizations MPW	Nong Bong Kai wetland area
3.4.2. To develop agreement on fishery zones, duration and appropriate size of nets with the fishermen.	19. Hold forums to gain agreement and actions on fishery management and fishing gear.	-	20,000	10,000	10,000	10,000	50,000	Yo Nok and Pa Sak Tambon Administration Organizations	Nong Bong Kai wetland area

Biological -- Water Bird Habitat Projects

Strategic Actions	Projects	Year					Total Budget (Baht)	Responsible Organization	Target areas
		2004	2005	2006	2007	2008			
4.1.1 To hold the activities for propagating and encouraging farmers and youth to gain knowledge and understanding of water birds and wetland.	20. Produce public relation medias and Manual of Birds in Nong Bong Kai Wetland for building awareness and knowledge about water birds and wetlands	-	200,000	-	100,000	-	300,000	ONEP/MPW, Yo Nok and Pa Sak Administration Organization	2 Tambons
	21. Provide equipment and training of youth and Puean Nok (Bird Lover) group members	-	120,000	50,000	50,000	-	220,000	ONEP/MPW/ Puean Nok Group, Wetlands International	Nong Bong Kai wetland and basin area
	22. Hold Klong Kwan Nok Nam ceremony (Spirit of Water Birds), Nong Bong Kai wetland.	100,000	100,000	100,000	100,000	100,000	500,000	ONEP /MPW Yo Nok and Pa Sak Administration Organization, Non-Hunting Area	Nong Bong Kai wetland
4.1.2. To set up the boundary and measures on conserving the water birds' resting areas which are sensitive to destruction with the participation of farmers and youth.	23. Survey and produce boundary signage of sensitive bird resting areas in Nong Bong Kai wetland	20,000	20,000	20,000	20,000	20,000	100,000	Non-Hunting Area, *Puean* Nok Group	Nong Bong Kai wetland
4.1.3. To study and evaluate the economic value of	24. Study and evaluate the economic damage to paddy grains destroyed by	-	200,000	-	-	-	200,000	ONEP/ MPW	2 Tambons

Strategic Actions	Projects	Year					Total Budget (Baht)	Responsible Organization	Target areas
		2004	2005	2006	2007	2008			
damage to paddy grains destroyed by water birds and set up the guidelines and criteria for compensation for farmers.	water birds and set up the appropriate compensation.								
4.2.1. To set up guidelines, locations and appropriate timing for keeping animals in the areas. It is an agreement of groups keeping buffalo, land owners and officers.	25. Hold meeting with groups keeping buffalo to set up appropriate grazing areas and agreements.	-	30,000	30,000	30,000	30,000	120,000	Yo Nok Tambon Administration Organization, Non-hunting area, animal keeping groups	Nong Bong Kai wetland area and basin areas

Physio –Chemical -- Water Quality Projects

Guideline	Strategic Actions	Projects	Year					Total Budget (Baht)	Responsible Organization	Target areas
			2004	2005	2006	2007	2008			
5.1. To support increasing farmers' knowledge of the damage from chemical substance use.	5.1.1. To support increasing farmers' knowledge of the damage and effect of herbicides	26. Train farmers on bio fertilization and. non-chemical agriculture	-	100,000	100,000	100,000	100,000	400,000	ONEP/MPW Chiang Rai Land Development Office, Chiang Rai Agriculture Extension Office	Farmers around wetland areas in 2 Tambon (500 families)
	5.1.2. To support increasing the farmers' knowledge and understanding of the techniques and methods of using and producing biological herbicide and fertilizers in the community.	27. Produce the pill fermented fertilizer and liquid Cherry snail biological fertilizer.	100,000	100,000	100,000	100,000	100,000	500,000	Biological fertilization group, ONEP, MPW, Chiang Rai Provincial Agriculture Office	Farmers who live in 2 tambons around wetland (500 families)
5.2 To manage and control source of pollution, waste matter and garbage in system.	5.2.1. To encourage and propagate information to the communities and tourists to decrease quantity of waste matter and garbage in Nong Bong Kai wetland and nearby areas.	28. Encourage and set up the non-garbage zone around Nong Bong Kai wetland area.	-	30,000	-	20,000	-	50,000	Yo Nok and Pa Sak Tambon Administration Organizations	Communities around Nong Bong Kai Wetland

Guideline	Strategic Actions	Projects	Year					Total Budget (Baht)	Responsible Organization	Target areas
			2004	2005	2006	2007	2008			
	5.2.2. T o set up the Tambon Administration Organization measure and regulation on control of effective and systematic garbage and waste matter eradication.	29. To set up the regulation on environment control of Tambon Administration Organizations	-	30,000	-	20,000	-	50,000	Yo Nok and Pa Sak Tambon Administration Organizations	Communities around wetland area
5.3. To monitor the water quality in wetland and nearby canals.	5.3.1. To set up method and site of water specimen collection for water quality monitoring.	30. Provide equipment for monitoring water quality.	-	200,000	200,000	100,000	100,000	600,000	Non hunting area, schools Chiang Rai Provincial Natural Resources and Environment Office	Wetland area and nearby water sources
	5.3.2. To hold the training for village volunteers and community network have knowledge and ability to support water quality monitoring implementation	31. Train the water quality monitoring volunteers in Nong Bong Kai wetland	-	100,000	-	100,000	-	200,000	ONEP./ MPW Chiang Rai Provincial Natural Resources and Environment Office	2 Tambons

Use and Management -- Land Development and Management Projects

Guideline	Strategic Actions	Projects	Year					Total Budget (Baht)	Responsible Organization	Target areas
			2004	2005	2006	2007	2008			
6.1. To survey and set up a distinct boundary of the Nong Bong Kai Non-Hunting Area and potential areas to be added in the Non-Hunting Area.	6.1.1. To survey and demarcate the distinct boundary of Nong Bong Kai Non-Hunting Area and evaluate potential areas which are appropriate to be additional conserved areas.	32. Survey the Nong Bong Kai Non-Hunting Area boundary (The existing boundary and potential additional areas)	-	-	150,000	-	-	150,000	Non-Hunting Area Tambon Administration Organization	Around Nong Bong Kai wetland Area
		33. Survey land ownership around Nong Bong Kai wetland area.	-	150,000	-	150,000	-	300,000	Yo Nok and Pa Sak Tambon Administration Organizations Non-Hunting Area	
	6.1.2. To revise the declaration of Nong Bong Kai Non-Hunting Area to inform the distinct boundary and consistent with the current situation with the community participation.	34. Survey and demarcate the boundary of Nong Bong Kai Non-Hunting Area. (according to the new declaration)	-	-	200,000	-	-	200,000	Non-Hunting Area	Around Nong Bong Kai Area

Guideline	Strategic Actions	Projects	Year					Total Budget (Baht)	Responsible Organization	Target areas
			2004	2005	2006	2007	2008			
6.2 To strengthen wetland management efficiency and potential on of officers of Non Hunting area, local administration organizations and communities according to RAMSAR Convention	6.2.1. To hold training to gain knowledge of wetland management to officers of Non-Hunting Area, local administration organization and community on according to RAMSAR Convention.	35. Training on wetland management according to Ramsar Convention.	-	100,000	100,000	100,000	100,000	400,000	ONEP /MPW	Related officers
	6.2.2. To hold training for community leaders and local administration organizations for participating in project implementation and assessment.	36. Train on implementation of the SWMP and monitoring system	150,000	-	150,000	-	-	300,000	ONEP /MPW, Chiang Rai Provincial Office	Related Officers and Strategy formulation team
		37. Support the monitoring of progress and reporting on the results of the Wetland Conservation and Restoration Fund (WCRF) implementation actions	30,000	50,000	50,000	-	-	130,000	ONEP /MPW.	Member of the Fund, MPW
	6.2.3. To hold study tours on wetland management at the successful sites in Thailand.	38. Project of Study tour on Wetland Management in Thailand for concerned officers and working team	-	200,000	200,000	-	-	400,000	ONEP /MPW Wetlands International	The North-East of Thailand

Guideline	Strategic Actions	Projects	Year					Total Budget (Baht)	Responsible Organization	Target areas
			2004	2005	2006	2007	2008			
	6.2.4. To establish Nong Bong Kai wetland management committee that consists of government agency, NGOs, local leaders and conservation group.	39. Establish Nong Bong Kai wetland Management Committee	100,000	100,000	100,000	100,000	100,000	500,000	ONEP/MPW, Non-Hunting Area	The Chief of Non-Hunting Area, Representatives of government agencies and people
	6.2 5. To establish community volunteer group to join with the officers for monitoring encroachment, destruction and use of wetlands and the surrounding areas.	40. Volunteer inspections around Nong Bong Kai wetland area.	20,000	20,000	20,000	20,000	20,000	100,000	Non-Hunting Area and wetland protection volunteer	Around Nong Bong Kai wetland area

Use and Management -- Ecosystem Awareness Projects

Strategic Actions	Projects	Year					Total Budget (Baht)	Responsible Organization	Target areas
		2004	2005	2006	2007	2008			
7.1.1. To survey and develop areas od aquatic plant and animal resources which have high potential as an ecotourism attraction.	41. Develop the landscape around Nong Bong Kai lake to promote ecotourism.	-	4 million	2 million	-	-	6,000,000	The Tourism Authority of Thailand, Chiang Rai Provincial Administration Organization	Recreation and Service zones.
7.1.2. To make a plan for public relations and promotion brochures on ecotourism attractions and the important tourism activities in the wetlands and surrounding areas.	42. Produce materials for publicizing tourism in Nong Bong Kai wetland area.	-	100,000	-	100,000	-	200,000	Chiang Rai Provincial Office, The Tourism Authority of Thailand	Nong Bong Kai wetland
	43. Establish volunteers work at information center for coordinating and propagating recreation activities.	30,000	30,000	30,000	30,000	30,000	150,000	Yo Nok and Pa Sak Tambon Administration Organization, Non-Hunting area, volunteers.	
	44. Chiang Rai mass media to visit the implementation areas.	30,000	-	30,000	-	-	60,000	ONEP. /MPW	
7.1.3. To hold training for communities and youth to participate in tourism activities for generating additional income.	45. Train communities and youth on ecotourism and tourism management.	50,000	50,000	50,000	50,000	50,000	250,000	ONEP /MPW, Chiang Rai Provincial Office. The Tourism Authority of Thailand	

Appendix 3.

Project Proposal example

Surveillance and Monitoring Water Quality in the Nong Bong Kai Non-Hunting Area

Name of Project

Surveillance and Monitoring Water Quality of the Nong Bong Kai Non-hunting Area

Objectives of Project

- To provide the PAMT and other stakeholders with knowledge about the ecosystem and environmental situation, and encourage the building of awareness in the 2 Tambons.
- To set up a process of surveillance, monitoring and testing, and then apply it to Nong Bong Kai Lake

The responsible agency-

Nong Bong Kai Non-Hunting Area and schools

Budget:

600,000 Baht per year (Budget from ONEP/MPW)

Duration

The 1st - 6th month is required for preparing the tools, equipment and training. The 7th - 12th month will involve collecting data and monitoring the result.

Consistency of strategies

It responds to the objectives of strategies like these

- To provide the knowledge about wetland management and conservation to stakeholders and students.
- To enhance effectiveness in management of water quality in Nong Bong Kai wetland area.

Project Concept

- Ecosystem monitoring – to develop a data system of habitat for aquatic animals and Benthos in the lake area that may be affected by land use.
- Water quality monitoring – to monitor the presence and absence of animal species that can indicate the water quality.
- Monitoring physical and chemical characteristics of the water – to analyze water quality through physical and chemical analysis in the laboratory by collecting water samples from various locations. This method can determine the present and predict the trends in water quality.

The outcome of the project

- Database of water quality in terms of biological, physical and chemical properties and its suitability for aquatic organisms.

An example of project evaluation

Criteria (set by PAMT)	Surveillance and Monitoring Water Quality
Order of magnitude of the project's importance	The project is important and consistent with vision, goals and objectives of strategies.
Is the project consistent with the principles of RAMSAR Convention?	The principle of ecosystem management that is specified in the RAMSAR Convention refers to participation in management, coordination and use of the area consistent with it's resource capacity, to avoid negatively affecting the ecosystem. Therefore, data on changes to wetland ecosystem is necessary
Does PAMT have a role in implementation?	For implementation, the project specifies PAMT participates in data collection following the above designed format and there is training for building understanding before implementation.
Consistency and urgent need	Although the data of Nong Bong Kai wetland area ecosystem is collected by MPW project, ecosystem status is always changing so data monitoring is necessary for building awareness among stakeholders and leads to cooperation in the conservation of Nong Bong Kai wetland area
Worthiness	The project set the budget 1 Baht for purchasing scientific equipment, tools for field data collection and so on, but most of the personnel who work with the project are volunteers so budget can be saved.
Outcome extension	The steps and processes follow scientific principles and are implemented by researchers and local people. The approach is consistent with international standards, so the experience and knowledge gained may be applied in other areas.
Risk	This project is possibly at risk if there is a lack of stakeholder's cooperation in implementation, but Non Hunting Area staff or other government officers can implemented it if budget is available.
Stability of the project	This project should be implemented continuously to best understand the status of the wetland ecosystem.
The support for other projects	This project is consistent with and supports other projects such as those building awareness and rehabilitating degenerated ecosystems, etc.

Appendix 4.

Order No. 1802 / 2547 Chiang Rai Provincial Office

Order of Chiang Rai Provincial office

Subject: Appointment of the working team for considering the budget requisition for wetland protection and management project Nong Bong Kai Nong Hunting Area, Chiang Rai Province.

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According to Chiang Rai Provincial office order no. 1489 / 2547 dated 24 June 2004 to appoint Nong Bong Kai wetland management strategy formulation working group for formulating the management strategy of Nong Bong Kai wetland, Chiang Rai Province.

To make sure the plan / project and budget requisition are done well, the budget requisition consideration working group was appointed as follows;

1. Chief of the provincial development strategy group, Chiang Rai Provincial office	Chairman and Member
2. Chief of Nong Bong Kai Nong Hunting Area	Member
3. Representative of Provincial Natural Resources and Environment Office, Chiang Rai Province	Member
4. Director of Planning & Budget Division, Chiang Rai Provincial Administration Organization	Member
5. Assistant of Yonok Tambon Administration Organization	Member
6. Assistant of Pasak Tambon Administration Organization	Member
7. Mr. Yanyong Srichareon	Member
8. Planning and Policy Analyst, Provincial Development Strategy Group, Chiang Rai Provincial Office	Secretary and Member

The working group has responsibilities as follows;

- To consider the proposed plan / projects for requesting the budget from government and related organizations.
- To undertake other responsibilities as assigned by the Governor

Accordingly, from now on

Order on 28 July 2004
Signed.....Direk Konklep
Deputy Governor

Certified Copy
(Mr. Sirichai Ruengrith)
Senior Environmental Specialist

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