



Provincial Biodiversity Strategy and Action Plan (2012-2020)

Xieng Khouang Province
Lao PDR

June 2013





Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity
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Provincial Biodiversity Strategy and Action Plan (2012-2020)

Provincial Department
Natural Resources and Environment

Xieng Khouang Province, June 2013



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Xieng Khouang Province
The Provincial Governor's Office

Re 324 /PG-XKH

Date 19/4/2013

Governor's Decision
Adoption and Promulgation of Xieng Khouang Biodiversity
Strategy Action Plan (2012-2020)

- Reference to Local Administration Law of Lao PDR No. 03/NA of 12/10/2003 Chapter III, Article 14 on the rights and duties of the Provincial Governor and Vientiane Capital Authority.
- Reference No 736/PoNRE of 25th March 2013, Natural Resources and Environment Division of Xieng Khouang Province.

The Xieng Khouang Governor agrees:

Article 1: Adoption and proclamation of Xieng Khouang Biodiversity Strategy and Action Plan, signed 25th March 2013 by the Director of Provincial Department of Natural Resources and Environment.

Article 2: Authorization by the Provincial Department of Natural Resources and Environment to coordinate with concerned agencies to implement the Biodiversity Strategy and Action Plan from 2012 to 2020.

Article 3: The Provincial Defense Office, the Provincial Public Security Office, the District Governor Offices and other concerned agencies fully accept and will implement this decision.

Article 4: This decision shall enter into force on the date of signature.

Governor of Xieng Khouang Province



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Xieng Khouang Province

Provincial Department of Natural Resources and Environment

Ref: 75 /PoNRE

25/03/2013

Foreword by PoNRE

Xieng Khouang is a province of Lao PDR located in a mountainous area in the Northern part of the country. Although Xieng Khouang Province has a relatively good road network, it remains time-consuming to travel within the province. The Xieng Khouang Plateau, covering most of the Peak District, is the third biggest plateau in Lao PDR. The climate of the plateau is the warmest of the province.

The province is also famous for tourist attractions including the Plain of Jars covering several districts, the Hot Springs in Kham District and the Phoukout Mountain, the highest mountain in Lao PDR. These and other attractions are potential sites for further development for tourism.

While Xieng Khouang Province has favorable conditions for socio-economic development, recent degradation of its natural resources has become a major challenge. Further, the impacts from heavy bombardments during the war have also led to a reduction of biodiversity. The provincial forest cover is currently only some 40 percent. In order to respond to these challenges, the central government and local authorities, among others, have put in place public information and awareness programs on the negative impacts from unsustainable use of natural resources.

Forest conservation areas have been established at various levels and collaboration with the international community is ongoing in order to develop and implement conservation and development initiatives.

While the results of the afore-mentioned programs have not yet shown immediate visible impacts, these initiatives are positive steps towards the recognition of the challenges and collaborative efforts between stakeholders.

Generally, the province is lacking human and financial resources. Additionally, the province has yet to prepare strategic guidelines on managing its vast natural resources.

Following the re-organization of MAF and MoNRE (2012), a number of new divisions and departments have been established including the Provincial Department of Natural Resources and Environment (PoNRE). MoNRE has supported Xieng Khouang Province in preparing the current Provincial Biodiversity Strategy and Action Plan. Our Department has regarded this as a good opportunity to involve all local stakeholders. This work belongs to the province and not to any individual organization.

Strategy development should not only be provided in colorful publications, but should also be translated into actions. All stakeholders must actively engage in the implementation of this Biodiversity Strategy and the Action Plan. Further, local, central and international collaborators should regularly meet to assess progress and share the lessons learned from its implementation.

On behalf of the PoNRE, as well as me personally, I strongly support the first Biodiversity Strategy and Action Plan for Xieng Khouang Province.

I would like to sincerely thank the Ministry of Natural Resources and Environment as well as the Department of Forest Resources Management and the IUCN Lao Country Program for their technical support and delivering valuable inputs over the course of the preparation of the Biodiversity Strategy and Action Plan. I would also like to thank GEF, UNDP, FAO, and the Agro-Biodiversity Project (ABP) for their financial and technical support and last, but not least, all participants at both the provincial and district levels, and in particular the vice district governors and their teams, for their active participation and comments and ideas to complete the task.

Director General
Natural Resources and Environment Department
Xieng Khouang Province

Foreword by ABP

The Provincial Biodiversity Strategy and Action Plan (PBSAP) for Xieng Khouang was prepared in conjunction with the drafting of the second National Agro-biodiversity Strategy and Action Plan (NBSAP-II). Most of the work of these two documents was commissioned to the IUCN Lao Country Program, the latter by the Agrobiodiversity Project (ABP).

The Department of Forest Resources Management of MoNRE has been the Government's coordinating force, whereas compilation of data and information were done by various provincial agencies coordinated by PoNRE and the IUCN Lao Country Program provided the secretarial assistance.

It should be stressed that the approach chosen by the IUCN Lao Country Program provided the foundation of a locally owned PBSAP. Hence, the final product is reflecting the current priorities and circumstances of the Xieng Khouang Province.

Part I and Part II were prepared in Lao language and the translation and editorial process proved to be much more challenging than anticipated and in many places have resulted in a shortened English text compared to the Lao version. Further, a forest category map has been omitted and a detailed livestock table has been converted to graphs using data from Agricultural Statistics Yearbook, 2010. Finally, substantial work has been done to convert Lao species to scientific and English names presented in 12 new tables. Special thanks are extended to Professor Dr. Kongmany Sydara, Mr. Onevilay Souliya, Mr. Somphanh Phanosith, Mr. Koutiane Sitthivong, and Mr. Wihane Sibounheuang for suggesting some of the scientific names.

It is hoped the report will find inspiration for similar work in other provinces in Lao PDR, as well as in other countries around the world.

Ole S. Pedersen
Chief Technical Advisor,
Agrobiodiversity Project

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Abbreviations

ABP	Agro-biodiversity Project
ABS	Access and Fair Benefit Sharing
COP	Conference of Parties
CBD	Convention on Biological Diversity
FAO	Food and Agriculture Organization of the United Nations
FFS	Farmer Fields Schools
GDP	Gross Domestic Product
GEF	Global Environmental Facility
IUCN	International Union for Conservation of Nature, Lao PDR
IPM	Integrated Pest Management
ITM	Institute for Traditional Medicine
Lao PDR	Lao People's Democratic Republic
MAF	Ministry of Agriculture and Forestry
MoNRE	Ministry of Natural Resources and Environment
MoU	Memorandum of Understanding
NBSAP	National Biodiversity Strategy and Action Plan
NTFP	Non Timber Forest Products
NUoL	National University of Lao
PAFO	Provincial Agricultural and Forestry Office
PBSAP	Provincial Biodiversity Strategy and Action Plan
PE&M	Provincial Energy and Mining Department
PI&C	Provincial Industry and Commerce Department
PPHD	Provincial Public Health Department
PS&T	Provincial Science and Technology Department
PPW&T	Provincial Public Work and Transport Department
PoNRE	Provincial Department of Natural Resources and Environment
PES	Payment for Ecological Services
PRF	Poverty Reduction Fund
PFRM	Provincial Forest Resources Management
PM	Prime Minister
PRF	Poverty Reduction Fund
SDC	Swiss Development Cooperation
SADU	Smallholder Agricultural Market Development in the Uplands of Lao Project
SAMADP	Sustainable Agriculture and Marketing Development Project
SNV	Netherlands Development Organization
SUFORD	Sustainable Forest Management and Rural Development Project
TABI	The Agro-Biodiversity Initiative project
UNDP	United Nations Development Program
UXO	Unexploded Ordinance

Currency: 1USD = 8,000 kip

Executive Summary

Lao PDR acceded to the International Convention of Biological Diversity (CBD) in 1996 and since then the country has developed a number of documents, including the second country report of the biodiversity status (2010) and the National Biodiversity Strategy and Action Plan 2016 - 2025 (NBSAP) is being prepared. In order to provide a better opportunity for local participation Xieng Khouang and Attapeu provinces were selected by the government in 2011 as model provinces for developing Provincial Biodiversity Strategy and Action Plans (PBSAPs).

Xieng Khouang Province is a mountainous area covering some 1.7 million ha, but is sparsely populated with less than 250,000 people of 5 main ethnic groups: Lao Loum, Thai Phuan, Hmong, Khmu and Tai Dam.

The infrastructure is relative well-developed connecting neighboring provinces and Vietnam. Phonsavanh, the provincial capital has an airport with daily flights to Vientiane.

The mining industry is active with approximately 15 mining companies exploring various minerals including gold, copper, iron, aluminum, zinc, lignite, and coal. Several hydropower plants are also operating or being developed. Additionally, and there is an increasing number of tourists are arriving for among others visiting the Plain of Jars.

The province is rich in natural resources and has a climate that is suitable for diversified agriculture. Protection of forests, including pine and hing forests, as well as rivers and watershed systems have a high priority, although widespread slash and burn agriculture has some negative effects to the forests and biodiversity. Two National Protected Areas (previously designated as NBCAs) are located in the province: Phou Sabot-Poung Chong NPA (8.7 percent of total area) and small parts of Nam Et-Phou Leoi NPA (less than 1 percent of total land area). The remaining approximate 35 percent of forests are divided into conservation, protection and production forests.

Soils are relatively infertile and extensively used as grassland for cattle, but the province is also known for its rice varieties (Khoa Kai Noi), as well as a number of temperate and subtropical fruits. Most farmers are growing various vegetables, but are also making good use of a larger number of medicinal plants and non-timber forests products providing supplementary food and income.

Due to the relatively high altitude, special typography and soils a number of unique plant, fungal and animal species are known for Xieng Khouang Province. These include two pines species, the evergreen *Dacrydium elatum* (local name: Mai Hing Hom) and the Fujian cypress (local name: Mai Long Leng). A wide range of Non Timber Forest Products are used locally or sold to traders, particularly Chinese traders.

One particular mushroom the “matsutake” is famous for Xieng Khouang Province and a significant amount of red brittlegills is exported to China. Many other mushroom species are collected for home consumption or sold at local markets.

Wildlife is relatively abundant and endangered mammal species include, sun bear, tiger, leopard, gibbons, gaur, southern serow, and dholes. Other rare mammals include monkeys,

barking deer, lesser mouse deer and wild boar.

The swallow is the symbol of the Xieng Khouang Province. Other known bird species include the green peafowl, greater coucal, egret, greater racket-tailed drongo, great, oriental and Wreathed hornbills, Green Imperial pigeon, eagles, Japanese quail, common flameback, Black-throated laughing-thrush, Silver pheasants, Red jungle fowl and the Asian barred owlet. The Silver pheasant, Great hornbill, Oriental pied hornbill, and Asian barred owlet are all threatened species.

Further, a number of reptiles and amphibians are commonly found including frogs, toads, Water dragon, geckos, various other lizards, the newly discovered Lao warty newt, and various snakes. Insects are widely collected and include, Bamboo borer/worms, wasps, winged termites, cicadas, crickets, grasshoppers, dragon fly, June bug, Dung beetle, Water scavenger, bees and Lemon ants.

Indigenous fish species include Walking catfish, Striped wallago catfish, Snakehead murrel, goonch, Tor, Zig-zak ell, Sole fish, and various carps.

Apart from paddy and upland rice, a great number of other field crops are cultivated including maize, sesame, jobs tears, and groundnut. Wild tea is cultivated in a few areas, as well as sub-tropical and temperate fruits, including peach and pear. Normally, the markets have a large variety of vegetables and herbs. Xieng Khouang is also known for large cattle breeds, but also for raising native poultry and pigs.

The demand for and consumption of natural resources has increased in both domestic and international markets and has resulted in a decreasing biodiversity and disappearances of species. The decrease is also due to various other factors such as slash and burn cultivation, uncontrolled and illegal logging and hunting, unsustainable harvesting of NTFPs, land concessions, and infrastructure developments.

A number of internationally funded biodiversity related projects are operating in Xieng Khouang including: Nam Ngum Watershed Management, Nam Et-Phou Leoi Conservation, Upland Agrobiodiversity project, the Agrobiodiversity Initiative Project and the Agrobiodiversity Project.

The Xieng Khouang Provincial Biodiversity Strategy and Action Plan has been developed based on vision to “holistically develop Xieng Khouang Province as a lively and attractive tourist destination associated with conservation and sustainable use of biodiversity and its supporting ecosystems”.

The Strategy for 2020 consists of five sub-strategies supported by a number of technical programmes: (1) Protect the diverse and economically important ecosystems including the species and genetic diversity found therein (five programs); (2) Integrate comprehensive conservation and sustainable use of biodiversity in accordance with the socio-economic development plan (two programs); (3) Record indigenous biodiversity knowledge and practices (one program); (4) Improve education and raise public awareness on the value of conservation and sustainable use of biodiversity (three programs); and (5) Implement provincial biodiversity strategy and action plan 2012-2020 (three programs).

The 14 programs are addressing issues related to key eco-systems (forest, wetland, agriculture, urban, and indigenous species), planning, traditional knowledge and practices, capacity development, awareness raising, coordination and monitoring,

Under each program, a total of 33 specific targets have been identified to be completed by 2020 and 46 targets by 2015. In turn these are supported by a total of 138 Action Plans and corresponding indicators.

The overall implementation responsibility of the PBSAP is the Provincial Biodiversity Steering Committee, chaired by the Vice Governor and under the committee; a technical working group will be formed consisting of representatives from various sectors, districts and civil organizations, meeting at least twice a year.

The technical working group will also report on PBSAP implementation status and taking part in subsequent PBSAPs and NBSAPs formulations.

Funds will be allocated to the province through the National Social and Economic Development Plan, as well as from grant aids, loans, private sector, innovative funds and projects.



Part I
Biodiversity Status
of Xieng Khouang
Province

Part I: Background and Biodiversity Status of Xieng Khouang Province

1. General Information

1.1 Convention on Biological Diversity

Lao PDR acceded to the International Convention of Biological Diversity (CBD) in 1996 and the country then committed itself to developing a National Biodiversity Strategy and Action Plan (NBSAP, 2004), as well as a second NBSAP 2016-2025.

1. In 2004, the first country report of the biodiversity status of the Lao PDR was prepared
2. In 2010, Lao prepared the fourth National Report to the Convention on Biological Biodiversity and participated in the meeting of COP10 in Nagoya, Japan.
3. In 2011-2012, an Assessment Report of the first NBSAP was prepared by the Department of Forest Resources Management and the preparation of the NBSAP 2016-2025 began in 2011.
4. The COP10 meeting in 2010 highlighted the importance of participating member countries to prepare a Biodiversity Strategy and Action Plans at the local level and thereby provide a better opportunity for local participation in biodiversity protection. To meet these needs, Xieng Khouang and Attapeu provinces showed interest to become models for developing Provincial Biodiversity Strategy and Action Plans (PBSAPs). This PBSAP for Xieng Khouang Province is funded by the GEF-UNDP-FAO through the Agrobiodiversity Project (ABP).

1.2 Location, boundaries and topography

Xieng Khouang Province is located in the Northeastern part of Lao PDR, at a distance of approximately 400 km from Vientiane Capital. The total land area of the province is 16,850 km² sharing borders with Vietnam



Map 1: Location, Xieng Khouang



Map 2: Districts of Xieng Khouang Province

(Nge An Province) to the east, Huaphan Province to the northeast, Luang Prabang to the northwest, Vientiane to southwest and Xaysomboun and Bolikhamxay to the south, see Map 1 and 2. Geographically, Xieng Khouang Province is characterized as a mountainous area (90 percent), with a plateau area (8 percent) and lowland paddy area (2 percent). The province is located between 500 to 2,280 m above sea level. Phonsavanh, is the capital city.

1.3 Administrative units, population and ethnic groups

Xieng Khouang Province is divided into 8 districts (see Map 2), 56 village clusters, 502 villages, 41,449 households and has a population of approximately 246,650 (2010) of which 49 percent are females. The population density is only 15 people/km² and the population is increasing at a rate of 3.2 percent per year with a life expectancy of 64 years. The Xieng Khouang population is made up of 5 main ethnic groups; the largest are the Lao Loum (52 percent), Hmong (38 percent) and Khmu (8 percent).

Table 1: Population and households, by district, 2010

No	District	Population	Female	Houshold
1	Paek	72,015	50%	12,780
2	Kham	49,982	49%	7,592
3	Nong Het	37,727	49%	5,447
4	Phoukout	24,323	50%	4,057
5	Pha Xay	12,454	49%	2,192
6	Khoun	33,628	50%	5,158
7	Mok	12,273	47%	1,847
8	Tha Thom	14,248	47%	2,376
	Total	256,650	49%	41,449

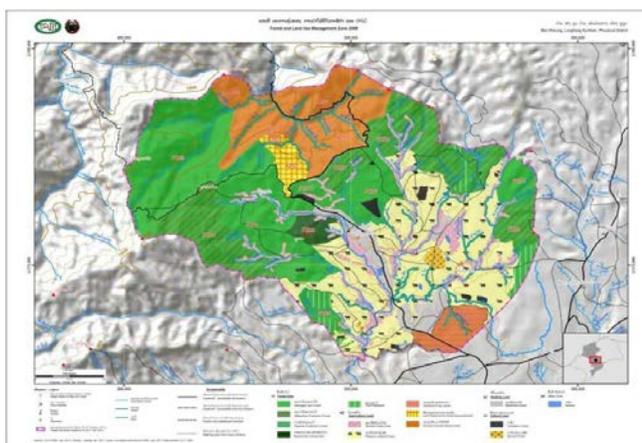
Source: Planning and Investment Department. Xieng Khouang

1.4 Climate

The province experiences two seasons, a dry (winter) and a rainy season. The dry season lasts from October to March and the rainy season is from April to September with the heaviest rain from June to August. The average temperature is 20.5° C, the rainfall is 1,500 mm/year, the humidity averages around 40 percent and the province receives in average 2,150 hours/year of sunlight.

1.5 Land use

Eight categories of land use is recorded in Xieng Khouang Province, see table 2. Only Tha Thom District has formal allocation of industrial and cultural land. However, it is reported that 91 land plots have been granted concessions of which the majority (40 plots) have been leased for industrial purposes; while there are only 30 areas designated for agriculture and 19 others for business. At the village level, participatory forest and land use planning is ongoing, see example Map 2.



Map 3: Village land use planning, Phoukout District

Table 2: Land use ('000 ha), by district

No	Land use category	Paek	Phou-khout	Pha Xay	Khoun	Kham	Mok	Nong Het	Tha Thom
1	Agricultural Land	65.7	146.2	57.6	81.0	66.2	72.9	77.5	5.3
2	Forest Land	47.0	106.3	40.4	96.4	144.9	132.9	124.6	73.2
3	Wetland	1.3	1.4	0.4	0.4	0.8	0.9	0.9	1.6
4	Industrial Land	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
5	Road and airport	1.2	0.4	0.2	0.3	0.5	0.2	0.4	2.9
6	Cultural Land	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
7	Urban area	2.1	0.4	0.4	0.8	0.9	0.2	0.7	43.5
8	Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
	Total	117.3	254.6	98.9	179.0	213.3	207.1	204.1	28.0

Source: Land Management Authority, 2011

The forest cover of the province is estimated to be 43 percent of the total land area and important catchment areas for the Ngum, Khao, Mat, Ngiep, Xan, and Moo rivers containing more than 102 tributaries. In addition, there are a total of 80 fish conservation zones, 46 fishponds and 38 reservoirs (see Table 3).

Table 3: Wetland types for potential fishing, by district

No	District	Fish conservation zone	Reservoir	Fish pond	Major tributary
1	Paek	n/a	n/a	n/a	n/a
2	Kham	23	14	14	14
3	Nong Het	4	2	0	0
4	Phoukout	23	11	11	22
5	Pha Xay	4	5	0	8
6	Khoun	2	6	21	52
7	Mok	1	0	0	8
8	Tha Thom	23	0	0	8
	Total	80	38	46	102

Source: Livestock and Fisheries Section, PAFO

1.6 Forest categories

The three government defined forest categories (production, protection and conservation forests) are represented in Xieng Khouang Province.

a) Conservation forest

The province has two national level Conservation Forests (National Protected Areas [NPAs]): Phou Sa Bot - Phung Chong NPA covering two districts: Kham and Nong Het with a total area of 149,000 ha (18.7 percent total land area) and a small proportion of Nam Et - Phou Leoi NPA (8,000 ha) bordering Huaphan and Luang Prabang provinces. Furthermore, there are three District Conservation Forests: Phou

Table 4: Provincial conservation forests

No	Conservation forest	District	Area (ha)
1	Nam Oun	Kham	1,400
2	Phou Nong	Kham	3,600
3	Phoukout	Phoukout	7,600
4	Phou Xo	Phoukout	6,400
5	Phou Peung	Paek	1,000
6	Phou Keng	Paek	1,000
7	Phou Hae	Paek	5,200
8	Phou Theung	Paek	1,400
9	Phou Xair	Pha Xay	1,200
10	Dong Hou Nouak	Khoun	6,000
11	Phou Khair	Khoun	4,600
12	Nam La-Nam Chong	Khoun	8,400
	Total		47,800

Source: Governor's Office

Pha Xay, Phou Nang Non and Phou Pha Tung and twelve Provincial Forest Conservation Areas totaling of 47,800 ha (Table 4).

b) Protection forest

The Protection Forest category serves mainly as watersheds/catchments with a total area of approximately 761,200 ha (Table 5).

Table 5: District protection forests

Protection forest/catchment	District	Area (ha)
Nam Ngum	Phoukout, Paek, Pha Xay and Kham	217,200
Nam Ngieb	Paek, Pha Xay, Khoun and Mok	144,500
Nam Mat	Kham, Nong Het, Paek, Khoun and Phoukout	163,500
Nam Khien - Nam Mo	Nong Het, Khoun and Kham	180,000
Nam Xan - Nam Phouak	Tha Thom and Mok	56,000
Total		761,200

Source: Protection forests. Governor's Office

c) Production forest

Production Forests cover three main areas: Nam Ngiep - Nam Jong, Long Khan – Long Khao and Nam Mo totaling 310,600 ha (Table 6).

Table 6: Provincial production forests

Production Forest	District	Area (ha)
Nam Ngiep - Nam Jong	Khoun, Tha Thom & Mok	122,300
Long Khan - Long Khao	Phoukout and Kham	97,800
Nam Mo	Mok Mai	90,500
Total		310,600

Source: Five year (2006-2010) implementation plan, PAFO.

1.7 Soils

Four main soil categories have been identified consisting of six soil groups, 15 types and 107 sub-types. The six groups are leptosols, cambisols, acrisols, lixisols, and luvisols. Nearly 600,000 ha (40 percent of total area) is grouped as high risk for soil erosion, land with moderate erosion risk covers more than 700,000 ha (45 percent) and slight erosion risk covers 20,000 ha or 0.1 percent.



Photo 3: Landscape, Paek District

Approximately 55 percent of the total areas are steep mountainous with scattered forest cover of some 900,000 ha or 58 percent of the provincial land area. Arable land covers some 7 percent. Xieng Khouang Province is known for its grassland area (295,000 ha), used for extensive livestock raising of mainly cattle.



Photo 4: Improved grassland

While soil chemistry differs throughout the province, the majority of the soils are very acid with pH normally ranging between 4.2 and 5.5. Organic matter in the soils is generally low at a range of 0.8-4.0 percent.

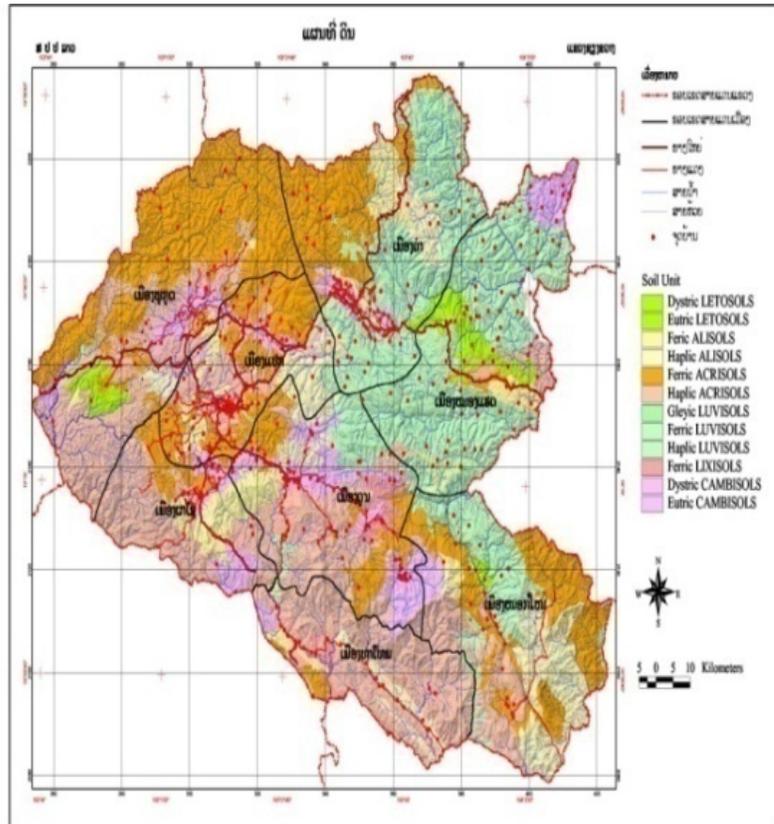
1.8 Economic development

The Xieng Khouang Province road network links neighboring provinces by roads 1C, 1D, 7, 5A, and 5B, as well as to by road 7B, which connects to Vietnam.

Detailed urban planning for the provincial capital (Phonsavanh) and all district towns is in initial stage supported by the Urban Planning Institute and the Provincial Public Work and Transportation. The provincial industry, handicraft and commerce sub-sectors have shown positive trends and to date, the province has a total of 159 processing plants and handicraft sites (18 wood processing and 49 furniture plants) of which 12 are large, 13 are medium and 107 are small-scale.

There are 18 community groups and nine factories producing handicrafts. The total economic value of processing and handicraft products is 252,390 billion kip per year.

Energy and mining sectors are experiencing rapid growth. Large scale hydropower development concessions have been granted at five sites, namely: Nam Ngiep II in Pha Xay District (preparation phase), Nam Ngum IV and Nam Ngum V (under construction) in Phoukout District, Nam San III in Khou District, Nam Mo and Tat Mo in Mok District, and Nam Pot in Pha Xay District.



Map 4: Soil map of Xieng Khouang Province



Photo 5: City center in Phonsavanh



Photo 6: Tung lake, Phukout District



Photo 7: Biogas construction, Phoukout District

MoUs for small scale hydropower development have been signed for Khao River in Kham District, Saen River (Tat Lang) in Pha Xay District, Tae River (Tat Wong) and Ma River in Kham District, Gniép river, 3A (Tad Thong) in Khou District, Mat I River, Mat II River, and Houay River in Nong Het District.

The province also promotes other renewable energy and to date there are 900 solar cells in 24 villages and 65 biogas plants across the province.

Mining has dramatically increased and to date, a total of 16 mining companies are operating in all districts except Mok District (see Table 7).

In addition, there are several small-scale mining enterprises including ten sites of lime explorations, ten sand exploration sites and various gravel explorations.

Besides giving concessions, the government is also encouraging companies to establish processing factories. Among others one iron factory, one copper factory, one zinc factory, and one cement factory are currently operating in the Province.

Table 7. Major mining activities, by district

District	Company and location	Activity
Paek	Phou Bia Mining Co. Ltd.	Copper and gold
	Lao Yong Shiefn Company surveys at Thaen mountain	Iron
	KKS Co. Ltd. at Paek and Phoukout districts	Gold and aluminium
	Victor Trail Co. Ltd. & Na Khone Louang New Century	Copper & others
Kham	Xo Dong Co. Ltd. at Dor Village	Iron
	Green Indochina Co. Ltd. at Na Luang Village	Copper
	Sing Huang Dao Co. Ltd. at Tha Village	Surveys
	Service Center for Mining and Mining Laboratory	Surveys
Phoukout	Phou Bia Mining Co. Ltd.	Copper and gold
	Vongthavixay Co. Ltd. at Nam Ngum III Reservoir	Lead and zinc
	KKS Co. Ltd.	Gold and aluminium
	Victor Trail Co. Ltd. & Na Khone Louang New Century	Copper & others
	Service Center for Mining and Mining Laboratory	Surveys
Khoun	Vi Co Minh Co. Ltd. at Gnuan mountain	Iron
	DAI Co. Ltd. at Nam Phan Village	Coal
	Ko Ey Ko Co. Ltd. at Loun Stream	Copper
	PPC Co. Ltd. in Longsan area	Gold
Pha Xay	Phou Bia Mining Co. Ltd.	Copper and gold
Nong Het	DAI Co. Ltd. at Pha Nieng area	Coal
	Thai Thung Co. Ltd. in Bor Kor & Bor Yeir area	Zink
	DICG Co. Ltd.	Lignite
Tha Thom	China Bass Ningbo Foreign Trade Co. Ltd.	Copper & others

Source: Provincial Department of Energy and Mines

The tourism sector has also experienced growth as the province has several natural, cultural, and historic attractions. Approximately 130,000 domestic and international tourists visit Xieng Khouang Province annually. There are more than 110 hotels, guesthouses and restaurants, eight tour agencies and one tourist company. The revenue received from the tourism sector equals some 9.1 million USD. Phonsavanh Airport serves daily flights connecting to Vientiane.

2. Conservation and sustainable use of biodiversity

In recent years, several projects have promoted conservation and sustainable use of biodiversity. These include the Sustainable Agriculture and Market Access Development Project (SAMADP) in Paek District under the support of Brot Für Die Welt - Germany and implemented by Agriculture Development and Sustainable Environment Association, and the Nam Ngum Watershed Management Project and a Poverty Reduction Fund Project. Successful conservation

zones have been established across the province, such as in Kham District (Phon Kham and Phieng Hong Villages), Nong Het district (Ja Meun Village) and Tha Tom District (Sybouheuang Village). Similarly, protected forest management has been carried out in Nong Het District (Nong Kop Village) and in Khoun District (Na Boung and Tham Villages).

Livestock husbandry has been supported at a number of sites such as piglet production in Pha Xay District (Khang Yao Village); cattle raising in Paek District (Lao, Phone Thong, Khung Vieng and Na Lan villages); and animal fodder production in Paek District (Mon Village), in Khoun District (Phou Mung Meuang, Pha Leum, Na Sy, Nong Pheu, Houay Lun, San King Villages), in Kham District (Nam Sai and Viengkham Villages), and in Nong Het District (Pa Hok and Houay Lom Villages).



Photo 8: Traditional preservation of bamboo shoots

The Agro-Biodiversity Initiative (TABI) has been supporting interventions in Phoukout District which includes improved technologies for bamboo and green algae (crispy river weed) cultivation, native pig and chicken raising, organic rice farming and marketing (Khao Kai Noi rice variety), biodiversity curriculum for primary and secondary schools, and conservation and sustainable use of medicinal plants.

3. General status of biodiversity



Photo 10: Wild tea, Paek District

The two NBCAs provide habitats for endangered species which include tigers, kateang, bears, and sun bears. Within and outside these areas, the province harbours additional rare and endangered animals such as the Lao warty newt and turtles and a number rare of plants.

Within the agricultural sector, there is rich agro-biodiversity including many crop species, varieties and landraces such as Khao Kai Noi rice, sweet corn, plums, apricot, peaches, water chestnut, chili, groundnut, and others.



Photo 9: Fokienia hodginsii Forest. Mok District

3.1 Wild plants and mushrooms

The province has a wide range of ecosystems with numerous wild species living under specific climatic conditions. Hence, many tree species, NTFPs including mushrooms and medicinal plants are unique in various locations across the province.

3.1.1 Trees

Important trees include conifer species, including two pines species (*Pinus merkusii* and *P. kesiya*), the

Table 8. Significant tree species, by district

Scientific Name	Local Name	District							
		Peek	Phou-Kout	Mok	Nong Het	Pha-xay	Khoun	Kham	Tha Thom
<i>Adinandra laotica</i>	Mai Man Pa								x
<i>Aiguillaria spp</i>	Mai Ket Sa Na		x	x	x	x	x	x	x
<i>Castanopsis echinocarpa</i>	Mai Kor Nam		x	x	x	x	x	x	X
<i>Castanopsis hystrix</i>	Mai Kor Daeng	x	x	x	x	x	x	x	x
<i>Castanopsis indica</i>	Mai Kor Nam	x							
<i>Dacrydium elatum</i>	Mai Hing Hom	x	x	x	x				
<i>Dalbergia cultrate</i>	Mai Ga Boar			x		x	x		x
<i>Diptocarpus spp.</i>	Mai Nyang/Gnang								x
<i>Dysoxylum sp.</i>	Mai Kwang Daeng			x		x	x		x
<i>Fokienia hodginsii</i>	Mai Long Leng		x	x	x	x	x		
<i>Hopea ferrea</i>	Mai Khan Heen			x		x			x
<i>Hopera odorata</i>	Mai Khan Heua			x			x		x
<i>Keteleeria evelyniana</i>	Mai Hing	x	x		x	x	x	x	x
<i>Lagerstroemia sp.</i>	Mai Pouay					x	x	x	x
<i>Lithocarpus sp</i>	Mai Kor Khee Mou		x	x	x	x	x	x	x
<i>Lithocarpus silvicolarium</i>	Mai Kor Khee Mou	x							
<i>Toxicodendron succedanea</i>	Mai Ket Lin	x	x	x	x	x	x	x	x
<i>Nauclea orientalis</i>	Mai Khan Leuang	x	x		x	x	x	x	
<i>Quercus serrata</i>	Mai Kor Khae	x	x	x	x	x	x	x	x
<i>Paramichelia baillonii</i>	Mai Ham Xai, Som Suai	x	x	x	x	x	x	x	x
<i>Pentace burmanica</i>	Mai Si Siet								x
<i>Protium serratum</i>	Mai Faen		x	x					x
<i>Pinus merkusii, P. kesiya</i>	Mai Paek song/sam bai	x	x	x	x	x	x	x	x
<i>Pterocarpus macrocarpus</i>	Mai Dou				x	x	x	x	x
<i>Sindora siamensis</i>	Mai Te Nam/Hor					x	x		x
<i>Tetrameles nudiflora</i>	Mai Phoung						x	x	x
<i>Vatica sp.</i>	Mai Xi								x

Source: Provincial participants in report preparation workshop, February, 2012

evergreen Mai Hing Hom (*Dracrydium elatum*) and the Fujian cypress (*Fokienia hodginsii*), various bamboo species including *Neobouzeana mekongensis* and *Sirundinaria spp.* Forest trees of high economic value include *Pterocarpus macrocarpus*, *Fokienia hodginsii*, *Dacrydium elatum*, *Pinus merkusii* and *P. kesiya*, *Hopea odorata*, *Sindora siamensis*, *Lagerstroemia sp.*, *Paramichelia baillonii*, *Toona surenii*, *Vatica harmandii*, *Vatica odorata*, *Diptorocarpus sp.*, *Betula alnoides*, *Adinandra laotica*, *Nauclea orientalis*, *Protium serratum*, *Bischofia javanica*, *Tetrameles nudiflora*, *Duabanga grandiflora*, (along small streams), *Lithocarpus sp.*, *Quercus sp.*, *Quercus serrata*, *Castanopsis sp.*, *Alstonia rostrata*, *Dalbergia cochinchinensis*, and *Pentace burmanica*. The district-wide distribution of significant trees is provided in below Table 8.



Photo 11: Palm tree

Logging is continuously taking place across the province and the government issued 21,075 m³ of logging permits in 2005-2006, 67,540 m³ in 2006-2007, 69,036 m³ in 2007-2008, 118,305 m³ in 2008-2009, and 24,000 m³ in 2009-2010.

3.1.2 Non Timber Forest Products

A wide range of Non Timber Forest Products (NTFPs) are found within the province including rattans, bamboos, medicinal plants and wild fruits mushrooms and vegetables.

3.1.2.1 Medicinal plants

Xieng Khouang Province provides habitat for a range of medicinal plants (see Table 9) and local people have rich tradition of using of these plants for various treatments.

Several medicinal plants are high-valued and some of these are exported particularly for the Chinese markets including the half-bent-back harbenaria, Berberine, Flemingia macrophylla, Siberian salomonseal,

Table 10: Price and merchants of medicinal plants

Medicinal plant/mushroom	Prices (kip/kg)	Merchant
<i>Habenaria medioflexa</i> Half bent-back Harbenaria Wan Khoun Lou-Nang Oua Wan Lai	Fresh: 350,000 - 500,000 Dried: over 1 million	Chinese and Vietnamese traders
<i>Coscium fenestratum</i> (Berberine) Kheua Haem	Fresh: 1,500 - 2,000	Local pharmaceutical factories Chinese traders
<i>Flemingia macrophylla</i> Houa Bi Thing/Hom Sam Mouang	Fresh: (bigger roots): 10 - 14 million Fresh: (smaller roots): 0.5 - 3 million	Chinese traders
Rubiaceae sp Serm Khang	Fresh: 5,000 - 7,000 Dried: 15,000 - 20,000	Chinese traders
<i>Polygonatum kingianum</i> Siberian Solomonseal Serm Pha/King Pha	Fresh: 40,000 Dried: 100,000-120,000	Chinese traders
<i>Melientha suavis</i> Houa Pak Van	Fresh: 5,000 Dried: 30,000	Chinese traders
<i>Stemona cochinchinensis</i> Houa Sam Sip/ Pom Kon Thouay	Fresh: 10,000 Dried: 30,000	Chinese traders
<i>Manihot esculenta</i> (Casava) Man Khao Kor	Fresh: 10,000 Dried: 25,000 - 35,000	Chinese traders
<i>Geodorum recurvum</i> Wan Nang	Fresh: 5,000 Dried: 20,000	Chinese traders Pharmaceutical Factory No 2
<i>Eleutherine bulbosa</i> American eleutherine Wan Jort	Fresh: 20,000	Chinese traders Pharmaceutical Factory No 2
<i>Uncaria</i> spp Nam Lep Houng	Fresh: 5,000 Dried: 20,000 - 25,000	Chinese traders
<i>Amorphophallus paenoiifolius</i> (Pom Houa Phouk)	Fresh: 5,000 Dried: 10,000 - 15,000	Chinese traders
<i>Schefflera elliptica</i> Kheua Lep Mue Nang	Fresh: 3,000	Vietnamese traders
<i>Elaeocarpus grandifloras</i> Nyar/Gnar Dok Pheung	Fresh: 15,000 - 500,000 Dried: 50,000 - 800,000	Vietnamese traders

Source: Provincial Division of Traditional Medicine

Stemona, and American eleutherine. Some species are uniquely found in specific areas, however, their population continues to decrease, making them rare.

Due to high demands, the prices of most medicinal plants are rapidly increasing. Current prices of important medicinal plants and one mushroom are shown in Table 10.



Photo 12: Seedbed of medicinal plants,



Photo 13: Eleutherine bulbosa

3.1.2.3 Bamboo



Photo 14: Bamboo

Bamboo is another multipurpose group. Almost all parts of the bamboo plants can be utilized. Important edible bamboo shoots species of include *Parathelypteris petilotii*, *Bambusa flexuosa*, *Phyllostachys spp.*, *Sirundinaria spp.*, *Dendrocalamus bamiltonii*, *Oxytenanthera parviflora*, *Dendrocalamus brandisii*, *Schizotachyum*

blumei, and *Dinochiosa scandeses*, see table 11.

Bamboo shoots grow very quickly during the rainy season, and local people use various techniques to preserve for year round consumption.

Other important NTFPs include rattan, cardamom orchids, vatica species for resin, diptocarps, peageon pea, palm fruits, club-moss, sichuan pepper, tamarind plum, Burmese mahogany, Meohmeria, mohtra reed, ginger, *Smilax perfoliata*, *Zeylon hydrolea* and *Melientha*, see Table 12. Many of these species are declining in numbers.

Table 11. Edible bamboo shoot species

Scientific name	Lacal Name
<i>Dendrocalmus lonoifimbriatus</i>	Mai Xang
<i>Schizostachyum blumei</i>	Mai Hia
<i>Bambusa tulda</i>	Mai Bong
<i>Bambusa bambus</i>	Mai Sang Phai
<i>Dendrocalamus membranaceus</i>	Mai Louang
<i>Bambusa blumeana</i>	Mai Phai Ban
<i>Dendrocalamus latifolius</i>	Mai Ving
<i>Bambusa triata</i>	Mai Xang Kham
<i>Sirundinaria sp</i>	Mai Lan
<i>Neobouzeana mekongensis</i>	Mai Ka Sean

Source: Workshop participants

Table 12. Important NTFPs

Scientific name	English Name	Lacal Name
<i>Calamus sp, Myrialepsis sp</i>	Rattan	Wai
<i>Amomum sp.</i>	Cardamom	Mak Naeng
<i>Orchidaceae</i>	Orchids	Dok Pheung
<i>Vatica odorata</i>	Vatia	Mai Chik Khi Xi
<i>Diptocarpus sp</i>	Diptocarp	Mai Gngang
<i>Cajanus cajan</i>	Peageon pea	Mai Khang
<i>Wallichia gracilis</i>	Palm tree	Mak Tao
<i>Byttneria andamanensis</i>	Byttneria	Heua Sam Hang
<i>Lycopodium cernuum</i>	Club-moss	Kheua Koot Daeng
<i>Zanthoxylum simulans</i>	Sichuan pepper	Mak Khaen
<i>Dialium indum</i>	Tamerind plum	Mak Kharm Phaeb
<i>Pentace burmanica</i>	Burmese mahogony	Peuak Siet
<i>Beohmeria malabarica</i>	Meohmeria	Peuak Meuak
<i>Thysanolaena maxima</i>	Broom grass	Dok Khaem
<i>Donax canniformis</i>	Mohtra reed	Kok Khar
<i>Zingiber officinale</i>	Ginger	Mak Khing Kheu
<i>Smilax perfoliata</i>	<i>Smilax perfoliata</i>	Bai Phak Kheung
<i>Hydrolea zeylanica</i>	Ceylon hydrolea	Mak Khai Khiet
<i>Melientha suavis</i>	<i>Melientha</i>	Pak Van Pa

Source: Workshop participants

3.1.2.3 Wild mushrooms

A significant number of wild mushrooms are consumed and sold at local and international markets (see Table 13). These include Spit gill, Wood ear, “Sawgill”, Termite mushrooms, Fishy milk cap, White brittle cap, Green cracking russula and “Caesar mushroom”. The most valuable is the “Xieng Khouang matsutake” mushroom sold fresh at local markets at 50,000-150,000 kip/kg. Significant amounts of dried red brittle caps, together with a surplus dried Matsutake are exported to China. The Ganoderma is also popular in Chinese markets for its medicinal properties. Many edible mushrooms are linked to the pine forests such as chanterelles.

Table 13. Selected mushrooms for consumption and sales

Scientific name	English name	Local name
<i>Amanita hemibupha</i>	Half-dyed slender caesar	Het Man Khai
<i>Amanita spp</i>	Amanita	Het Ngoua, Het La Ngok
<i>Auricularia spp.</i>	Wood ear	Het Tun, Het Hou Nou
<i>Boletus edulis s.l.</i>	“Bolete”	Het Nam Pheung
<i>Cantharellus cibarius sl</i>	Chanterelle	Het set
<i>Catathelasma ventricosum</i>	Golden needle mushroom	Het Ka Douk
<i>Cortinarius sp.</i>	Cortinarius	Het Phao
<i>Craterellus cornucopioides</i>	Horn of Plenty	Het Tip Dam
<i>Craterellus odoratus</i>	Fragrant chanterelle	Het Tip Leuang
<i>Ganoderma multipileum s.l.</i>	Ganoderma	Het Lin Jeu Het lin Chi
<i>Hebeloma sp.</i>	Hebeloma	Het Xa Het Wai
<i>Lactarius volemus s.l.</i>	Fishy milk cap	Het Yang
<i>Lentinus polychrous</i>	“Sawgill”	Het Bot
<i>Ramaria spp.</i>	Coral mushroom	Het Nouat
<i>Russula virescens</i>	Green cracking Russula	Het Khai Thao
<i>Russula sp.</i>	Red brittle cap	Het Kor Daeng/Dam /Taen
<i>Russula sp</i>	‘White brittle cap’	Het Tong Heo
<i>Termitomyces clypeatus</i>	Termite mushroom	Het Tap Mou
<i>Termitomyces eurrhizus</i>	Termite mushroom	Het Tap Khang
<i>Tricholoma crassa</i>		Het Hai
<i>Tricholoma fulvocastaneum</i>	“Matsuake”	Het Wai

Source: Workshop participants and ABP, sl: Alike or broad sense



Photo 16: Red brittle cap



Photo: 17 “Xieng Khouang Matsutake”



Photo 18: Green Cracking brittle cap



Photo 18: Hebeloma sp

3.2 Crops

Farmers are cultivating a number of different



Photo 19: Khao Kai Noi rice variety



Photo 20: Peach crop, Phoukout District



Photo 22: Plumst Phonsavanh market



Photo 21: Rice Phonsavanh market

are lowland and upland glutinous (Khao Niao) and non-glutinous (Khao Chao) rice of which nearly all are traditional varieties. Other field crops include, maize, sesame, jobs tears, groundnut, and wild tea (see Table 14). Chili is a common grown spice.

A large number of vegetables are cultivated including onion, garlic, Chinese mustard, tomato, baby corn, squash, pumpkin, cucumber, chayote, and beans.

In cold areas subtropical fruits are common such as peach, plum, pear, apple, and avocado, while in warmer areas tropical fruits are grown including mango, banana, papaya, water melon, guava, coconut and passion fruit.

Economically important crops are the local rice variety (Khao Kai Noi), maize, garlic, onion, cassava, groundnut, coffee, tea, passion fruit, jobs tears, sesame, sugar cane, and water chestnut.

Table 14. Common crops

Scientific name	English name	Lacal Name
<i>Field Crops</i>		
<i>Oryza indica</i>	Rice	Khao
<i>Zea mays</i>	Maize	Mak Saly
<i>Manihoc esculenta</i>	Casava	Man Ton
<i>Solanum tuberosum</i>	Potato	Man farang
<i>Camellia spp.</i>	Tea	Xar
<i>Coffea rubusta/ C. arabica</i>	Coffee	Cafe
<i>Coix lachryma-jobi</i>	Jobs tears	Mak Deuay
<i>Sesamum indicum</i>	Sesame	Mak Nga
<i>Saccharum sp.</i>	Sugar cane	Oy
<i>Nuts, spices & others</i>		
<i>Arachis hypogaea</i>	Groundnut	Thoua Din
<i>Piper nigrum</i>	black pepper	Mak mat
<i>Zingiber officinale</i>	Ginger	Mak Khing Kheu
<i>Capsicum spp.</i>	Chili	Mak Phet
<i>Eleocharis dulcis</i>	Water chestnut	Mak Heo

Source: Workshop participants

Table 15. Common vegetables, nuts, fruits, etc.

Scientific name	English name	Lacal name
<i>Vegetables</i>		
<i>Allium cepa</i>	Onion	Phak Thiem
<i>Allium sativum</i>	Garlic	Phak Boua
<i>Brassica oleracea</i>	Chinese mustard	Phak kaat kiew
<i>Solanum lycopersicum</i>	Tomato	Mak Len
<i>Vigna spp</i>	Beans	Phak Thua
<i>Zea mays</i>	Sweet corn	Mak Saly
<i>Cucurbita pepo</i>	Squash	
<i>Cucurbita pepo</i>	Pumpkin	Mak Ue
<i>Cucumis sativus</i>	Cucumber	Mak Taeng
<i>Sechium edule</i>	Chayote	Mak Sou
<i>Solanum violaceum</i>	Crispy brinjal	Mak Khaeng Khom
<i>Fruits and others</i>		
<i>Musa spp.</i>	Banana	Mak Kouay
<i>Passiflora edulis</i>	Passion fruit	Mak Not
<i>Pyrus pyrofolia</i>	Pear	Mak Khai
<i>Prunus persica</i>	Peach	Mak Man
<i>Prunus sp</i>	Plum	Mak Jong
<i>Annas comosus</i>	Pineapple	Mak nat
<i>Mangifera indicus</i>	Mango	Mak Mouang
<i>Piper nigrum</i>	Pepper	Mak Khaen
<i>Castanea sp</i>	Chestnut	Mak Kor
<i>Carica papaya</i>	Papaya	Mak houng
<i>Percea americana</i>	Avocado	Mak ber
<i>Tamarindus indica</i>	Tamarind	Mak Kharm
<i>Citrus limon</i>	Lemon	Mak Nao
<i>Cocus nucifera</i>	Coconut	Mak Phao
<i>Psitium guajava</i>	Guava	Mak Sida
<i>Punica granatum</i>	Pomegranate	Mak Phila
<i>Citrullus lanatus var. lanatus</i>	Water melon	Mak Mo

Source: Workshop participants

Most of the above mentioned species are unique to the province, and particularly Khao Kai Noi rice and the temperate/subtropical fruits and vegetables, which could be further promoted as strategic agricultural products of Xieng Khouang Province.

3.3 Wildlife

More than 40 percent of Xieng Khouang Province is covered with forests playing a significant role as natural habitats for wildlife including amphibians, reptiles, mammals, birds, insects and fish.

3.3.1 Mammals

Endangered mammal species include wild boar, sun bear, Asiatic black bear, tiger¹, leopard, gibbons, gaur, Sumatran serow, and dhole. Other mammals include monkeys, barking deer, lesser mouse deer, wild boar, hog badger, weasel, rats, rabbit, civets, flying lemur, porcupines including Asiatic brush-tailed porcupines, otter, and pangolin (see Table 16). With proper and adequate conservation and management measures in place several mammals in high risk of extinction can be kept at sustainable levels (e.g. tiger, pangolin, bears, gibbons, southern serow, and gaur).

Table 16. Significant mammals

Scientific name	English name	Lao Name
<i>Ursus thibetanus</i>	Asiatic black bear	Mi
<i>Helarpctos malayanus</i>	Malayan sun bear	Meuy
<i>Panthera tigris</i>	Tiger	Suea
<i>Panthera pardus</i>	Leopard	Suea dao
<i>Hylobates spp</i>	Gibbon	Thanee
<i>Capricornis sumatraensis</i>	Sumatran serow	Gneuang
<i>Cuon alpinus</i>	Dhole	Ma Nai
<i>Haplorhini spp</i>	Monkey	Ling
<i>Cervidae</i>	Deer	Quang
<i>Muntiacus muntjak</i>	Barking deer	Fan
<i>Tragulus kanchil</i>	Lesser mouse deer	Fan kai
<i>Sus scrofa</i>	Wild boar	Moo Pa
<i>Archonyx collaris</i>	Hog Badger	Moo Lueng
<i>Mustela spp</i>	Weasel	Jon Forn
<i>Rattus spp</i>	Rat	Ohn
<i>Nesolagus timminsi</i>	Annamite Striped Rabbit	Ketay
<i>Niverridae</i>	Civit	Ngen
<i>Sciuridae</i>	Squirrel	Galen
<i>Conocephalus volans</i>	Flying lemur	Bang
<i>Hystriognathi</i>	Porcupine	Men
<i>Atherurus macrourus</i>	Asiatic brushtailed porcupine	Horn
<i>Manis spp</i>	Pangolin	Lin
<i>Lutra spp</i>	Otter	Nak Nam

Source: Workshop participants

3.3.2 Amphibians and reptiles

There are many species of amphibians and reptiles unique to the province, including several that are critically endangered such as water monitor and some turtles and tortoises, (see Table 17).

Common species includes frogs, toads, water dragon, gecko, lizards, and various snakes. The recent discovery of a new salamander species, the Lao warty newt in Xieng Khouang Province not only confirms the abundance of biodiversity, but also adds attention to the province and the

Table 17. Selected amphibians and reptiles

Scientific name	English Name	Local Name
Amphibians		
Anuara	Frog	KokKhkiet
Anura	Toads	Khan/khak
<i>Physignathus cocincinus</i>	Water dragon	Ueng
<i>Paramesotriton laoensis</i>	Laos warty newt	Pa Tin
Lacertila	Lizard	Kapom
Gekkota	Gecko	Kabkae
Reptiles		
Chelonii/Testudinidae	Turtle/tortoise	Ou Lou/Or Lor
Serpentes	Snakes	Ngoo
<i>Varanus salvator</i>	Water monitor	Hier/Hier Lean

Source: Workshop participants

¹ Unconfirmed

country among scientists, tourists and business. Consequently, it also provides threats to rare species including salamanders, which are in high demand in the Chinese market.

3.3 Birds

The swallow is the symbol of the Xieng Khouang Province (see Table 18). Other important bird species include Green peafowl, doves, Eyebrowed Thrush, Greater coucal, egret, Greater racket-tailed drongo, Wreathed hornbill, Amur falk, Japanese quail, Common flameback, Black-throated laughing-thrush, Tricoloured munia, Crested serpent-eagle, Silver pheasant, Red jungle fowl, Great hornbill, and Oriental pied hornbill.

Table 18. Selected birds

Scientific name	English Name	Local Name
<i>Pavo muricus</i>	Green peafowl	Nok Gnung
<i>Streptopelia spp</i>	Doves	Nok Khao
<i>Turdus obscurus</i>	<i>Eyebrowed Thrush</i>	Nok Seet
<i>Centropus sinensis</i>	Greater coucal	Nok Kot puet
<i>Egretta spp</i>	Egret	Nok Gngang
<i>Dicrurus paradiseus</i>	Greater racket-tailed drongo	Nok Xeo
<i>Rhyticeros undolatus</i>	Wreathed hornbill	Nok Khor
<i>Ducula aenea</i>	Green imperial-pigeon	Nok Pao
<i>Falco amurensis</i>	Amurfalk	Nok Leo
<i>Cotumix japonica</i>	Japanese quail	Nok Khuem
<i>Dinopium javanense</i>	Common flameback	Nok Hoa khwan
<i>lanthocincla chinensis</i>	Black-thoated laughing-thrush	Nok Thua dam
<i>Lonchura malacca</i>	Tricoloured munia	Nok Kapit
<i>Spilomis cheela</i>	Crested serpent-eagle	Nok Hang
<i>Lophura nycthemera</i>	Silver pheasant	Kai Kua
<i>Gallus gallus</i>	Red Junglefowl	Kai Pa
<i>Buceros bicornis</i>	Great hornbill	Nok Kok khor kham
<i>Anthracoceros albirostris</i>	Oriental pied-hornbill	Nok Keang
<i>Glaucidium cuculoides</i>	Asian barred owlet	Nok Puet Pueng
<i>Hirundo rustica</i>	Ban Swallow	Nok An

Source: Workshop participants

The Silver pheasant, Great hornbill, Oriental pied hornbill and Asian barred owlet are threatened and could face extinction if proper conservation measures are not put in place.

3.3.4 Insects



Photo 23: Winged termite eggs

In Xieng Khouang there is a rich tradition of eating and trading insects such as Giant water bug, Bamboo borer/worms, wasps, winged termites, honey from Asian and Dwarf honey bees, cicadas, Mole crickets, grasshoppers, Dragon fly, June bug, Dung beetle, Water scavenger, bees, Lemon and Weaver ants, Common cockshafer, and ant bood. Some insects are threatened by an increased use of pesticides. The waxworm, winged termite eggs and Bamboo worms are regarded as delicacies.



Photo 24: Wasp nest

Other common invertebrates are crabs, arachnids, scorpions and Earth worms.

3.5 Fish species

Numerous fish species can be found in rivers, ponds and paddy rice fields across Xieng Khouang Province. Popular indigenous fish species including Walking catfish, Dwarf snakehead, Murrel snakehead, Dwarf goonch, tor, Zig-zak eel, Yellow tail book barb, Asian sole fish, Harmand's sole, Mackarel barb, Asian bumblebee catfish, Climbing perch, Striped flying barb, Nile tilapia, Grass carp, Silver carp, and Broadhead catfish.

Table 19. Selected insects and other invertebrates

Scientific name	English Name	Local Name
Insets		
<i>Lethocerus indicus</i>	Giant water bug	Meang Da
<i>Caelifera</i>	Larvae of grasshopper	Douang Khaem
<i>Omphisa fuscidentalis</i>	Bamboo borer/worm	Meang Cha luat
<i>Vespa spp</i>	Wasp	Tor/Taen
<i>Termitidae</i>	Winged termite	Meang
<i>Cicadidra</i>	Cicada	Chak Chan Mao
<i>Ensifera sp.</i>	Grass hopper	Meang Man
<i>Gryllotalpha africana</i>	Mole cricket	Meng Xorn
<i>Caelifera</i>	Grasshopper	Tak Taen
<i>Omphisa fuscidentalis</i>	Bamboo caterpillar	Mae
<i>Anisoptora</i>	Dragon fly	Meang Nam mouak
<i>Phyllophaga</i>	June bug	Meang Khua
<i>Scarabaeidae</i>	Dung beetle	Meang Juji/Chut Chii
<i>Hydrophilidae</i>	Water scavenger	Meang Tap tao
<i>Apis florea</i>	Dwarf honey bee	Pheung/Meang Mim
<i>Myrmelachista sp</i>	Lemon ant	Meang Dan
<i>Melolontha melolontha</i>	Common cockshafer	Meang Loun
<i>Apis cerana</i>	Asian honey bee	Meang Khee sout
<i>Oecophylla smaragdina</i>	Weaver ant	Mot Som
<i>Crematogaster</i>	Ant brood	Mot Hai
Other Invertebrates		
<i>Scorpiones</i>	Scorpion	Meang Knot
<i>Brachyura</i>	Crab	Kapoo
<i>Arachnida</i>	Arachnids	Khi Khep
<i>Lumbricus sp</i>	Earth worm	Khi Ka douan

Source: Workshop participants

Table 20. Important fish species

Scientific name	English Name	Local Name
<i>Clarias batrachus</i>	Walking catfish	Pa Douk
<i>Channa gachau</i>	Dwarf snakehead	Pa Kang
<i>Chana striata</i>	Murrel Snakehead	Pa Khor
<i>Bagarius yarrelli</i>	Goonch	Pa Khea
<i>Bagarius bagarius</i>	Dwarf goonch	Pa Ke
<i>Tor sinensis</i>	Tor	Pa Daeng
<i>Mastacembelus amatus</i>	Zig-zak eel	Pa Lat
<i>Poropuntius deauratus</i>	Yellow Tail Brook Barb	Pa Jat
<i>Neolissochilus blanci</i>	Neolissochilus blanci	Pa Song/Phong
<i>Scaphiodontichthys acanthopterus</i>	Scaphiodontichthys	Pa Mom
<i>Brachirus panoides</i>	Asian sole fish	Pa Pan gnai
<i>Brachirus harmandi</i>	Harmand's sole	Pa Pe
<i>Opsarius pulchellus</i>	Mackarel barb	Pa Lai khuang
<i>Pseudomystus siamensis</i>	Asian bumblebee catfish	Pa Khee hia
<i>Anabas testiduneus</i>	Climbing perch	Pa Kheg
<i>Pangasius conchophilus</i>	<i>Pangasius</i>	Pa Pok
<i>Systemus binotatus</i>	Common barb	Pa Feak
<i>Esomus metallicus</i>	Striped flying barb	Pa Sieu houa gnen
<i>Oreochromis niloticus</i>	Nile tilapia	Pa Nin
<i>Ctenopharyngodon idella</i>	Grass carp	Pa Kin Gnia
<i>Hypophthalmichthys molitrix</i>	Silver carp	Pa Ket laeb
<i>Clarius macrocephalus</i>	Broadhead catfish	Pa Douk

Source: Workshop participants

Recently, indigenous fish species are declining due to decreasing water levels and destruction of habitats from chemical contamination possibly related to mining and other activities.

Aquaculture is also continuously developing with the majority of species cultivated being non-native species, including Nile tilapia, Grass carp, Silver carp, catfish, and Indian carp. There is almost no breeding of native fish.

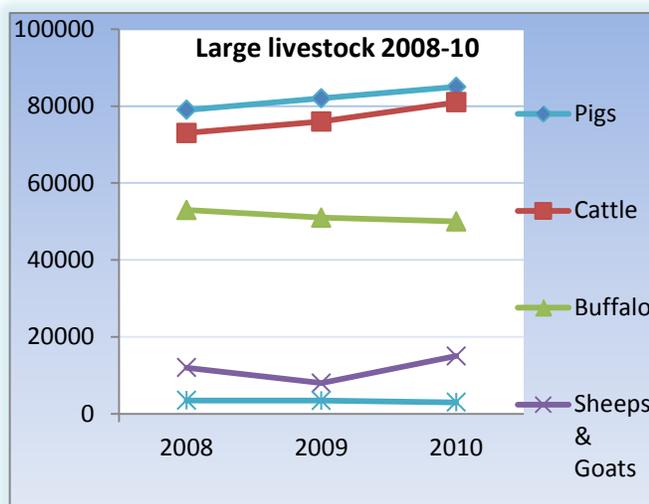


Photo 25: Catching fish

3.4 Animal Livestock

3.4.1 Large livestock

Large livestock is dominated by local breeds, due to better resistance to diseases and taste. Raising large animals is an important activity of all smallholders and the surplus is sold at local markets. The province aims to further develop the livestock sector to meet the increasing demand for domestic consumption and export, which currently amounts to 5-10 percent of the production. Large livestock include cattle, buffalo, horse, pig, goat, and sheep of which pig and cattle raising is the most popular with approximately 85,000 and 81,000 head, respectively in 2010 with some 5 percent yearly increase (see Figure 1). Also sheep and goats have increased but at lower levels (15,000 head in 2010). Buffalo and horse raising is in decline reaching a 2010 level of 50,000 head and 3,000 head respectively in 2010.



Source: Yearbook 2010, DoPC, 2011

Figure 1: Large animal livestock development 2008-2010

There are nine large cow-buffalo farms, three large pig farms, seven large goat-sheep farms, and two large poultry farms within the province.



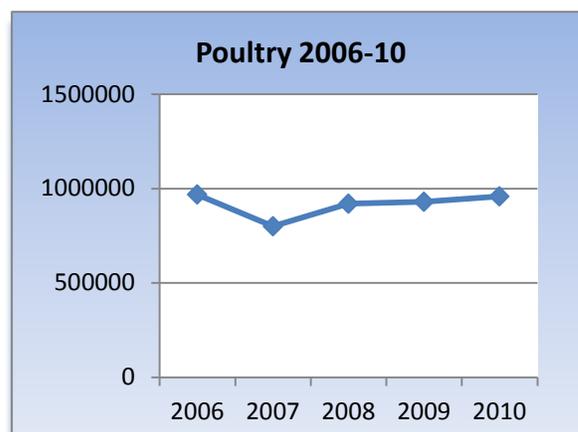
Photo 26: Native pigs

3.4.2 Poultry



Photo 27: Native chicken

Poultry raising is mainly for home consumption and an important part of the farming system. In 2010, it reached the 2006 production levels of approximately one million head after a 17



Source: Yearbook 2010, DoPC, 2011

Figure 2: Poultry development, 2006-2010

percent fall in 2007 related to disease (see Figure 2). Poultry husbandry in the province consists mainly of native chicken including Black meat chicken but also smaller amounts of ducks, turkeys, pigeons, geese and quails are raised.

4. Threats to biodiversity



Photo 28: Slash and burn agriculture

In general, easier access and increasing demands for wildlife are putting pressure upon natural resources and biodiversity within the province. With exception of a few species, no systematic biodiversity data has been recorded. However, it is widely believed that biodiversity is declining and some species are already extinct or threatened by extinction.



Photo 30: Illegal logging

The underlying causes are:

- The practice of slash and burn agriculture and forest fires
- Expansion of agriculture land and uncontrolled and illegal exploitation
- Larger infrastructure development projects such as hydropower, dams, roads, and mining
- Use of chemicals in the agriculture and industry sectors
- Lack of good management and monitoring
- Higher demand domestically and internationally

5. The economic value of biodiversity



Photo 29: Cash crops

There are obviously many benefits from sustainably managing the biodiversity although difficult to estimate the economic, social and environmental values and its related ecosystem services. Nevertheless, numerous agrobiodiversity produce and products are a key source of income and partly can be measured by the value of export and local circulation figures of agricultural, livestock and wood (including handicraft) and non-timber forest products totaling a value of

USD 14.2 million.

6. Biodiversity related legislation

There are several laws and regulations concerning biodiversity at central and local levels. PAFO is working closely with the Department of Commerce and Industry to disseminate laws and regulations including the Forestry Law, Wildlife Law, Fisheries and Aquatic Law. Furthermore, twelve provincial conservation forests were created in advocacy for sustainable management

including regularly monitoring and patrolling by provincial forest inspection staff and local authorities (see Table 21).

Table 21. Legislation applicable to conservation and sustainable use of biodiversity

No	Law/Decree	Strategy/Action plan/Regulation	Regulation
1	Law on water and water resources (1996)	- National Water Resource Policy and Strategy, 2010	
2	Environmental Protection Law (1999) Decree on Setting up a Reservoir Management Committee (2010) Decree on Disaster Management Committees (1999) Decree on Establishment of National Wetlands of Ramsar	- Climate Change Strategy 2020 (2010) - Action Plan for National Adaptation on Climate Change (2009) - National Strategic Disaster Management Plan (2020)	- Regulations related to environmental and social assessment (2010) - Hygiene, sanitation and health promotion regulations (2008)
3	Law on Agriculture (1998)		- Fertilizer regulation and use (2008) - Pesticide regulations (2000) - Ministerial Decision on Organic Agriculture standards (2005)
4	Law on National Heritage, History and Nature (2005)		
5	Land Law (2003) Decree on State Land Lease (2009)		
6	Law on Tourism (2005)	- Lao PDR Tourism Strategy to 2020	
7	Forestry Law (2007)	- National Forest Strategy to 2020 - National Biodiversity Strategy and Action Plan to 2020	- Provincial Notification termination of logging, NTFPs and wildlife in Phou Louang Protected Area Km 10 (Nam Thong - Not Mo), Mok District (2011). - DAFO Kham District Circular prohibition of slash and burn and hunting of wildlife outside permitted areas.
8	Law on Mining (1997)		
9	Law on Fisheries and Aquatic Resources (2007)		
10	Electricity Law (1997)	- Energy and Renewable Energy Strategy to 2025	
11	Aquatic and Wildlife Law (2007)		
12	Law on Local Administration (2003)	- 7 th NSEDP	
13	Foreign Investment Promotion Law (2009)		
14	Law on Livestock Production and Veterinary Matters (2008)		
15	Law on Drugs and Medical Products (2000) Decree on Natural Resources for Medicine (2007)		- Provincial Governor decision on establishment of Committee for Natural Resources for Medicine (2010). - Provincial curriculum on promotion and management of Natural Resources for medicine and traditional medicine (2010). - Regulation on Kham District on Biodiversity Management of Long Lan Protected Area.

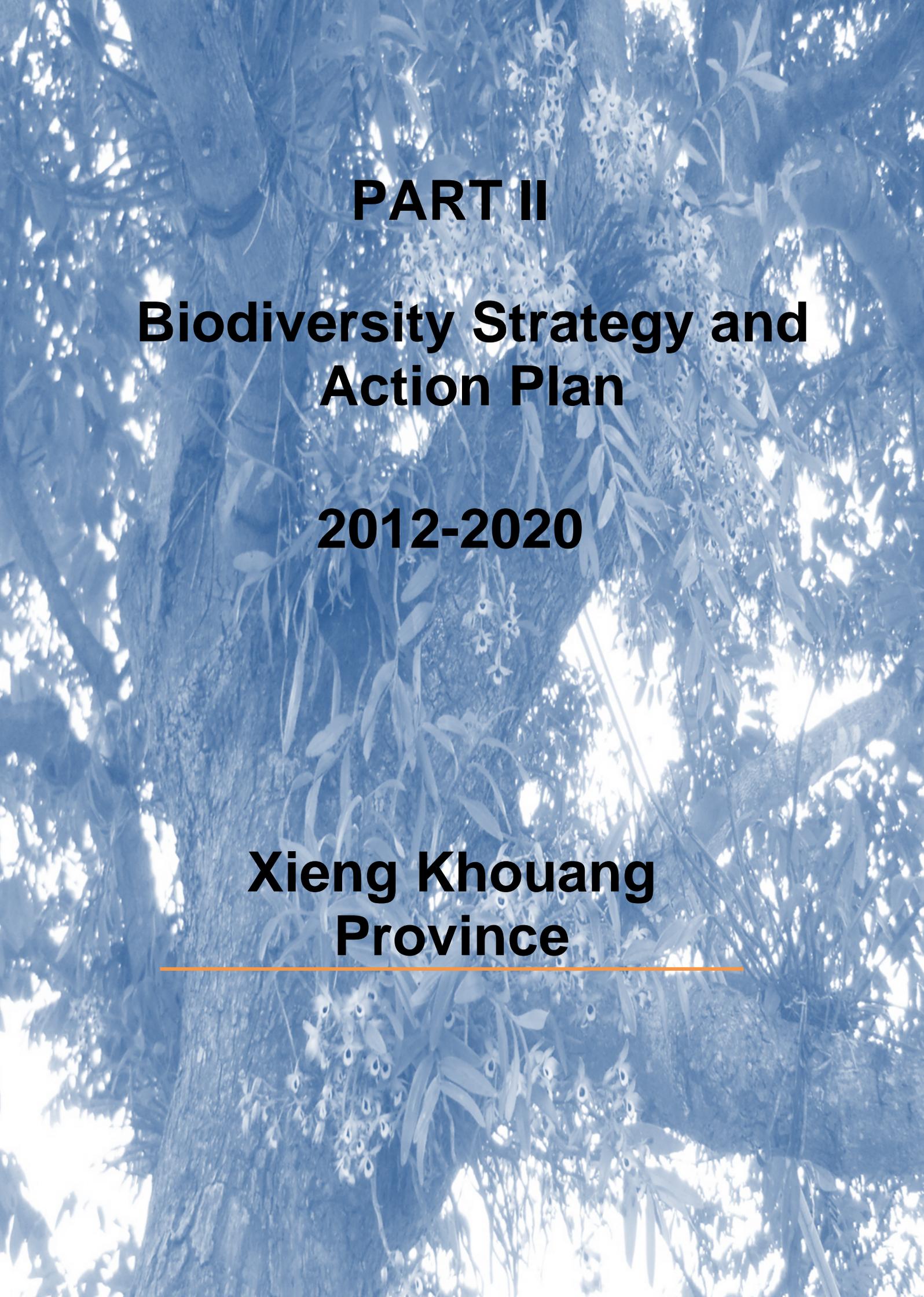
Source: Workshop participants

7. Biodiversity priorities

Biodiversity within Xieng Khouang Province is increasingly being threatened due to various forms of exploitation and overharvesting resulting in some species becoming extinct and many being in high risk of extinction. Therefore, to encourage biodiversity for sustainable use, it is necessary to have appropriate policies and plans for conservation and sustainable use.

The following priorities are proposed:

- Promote native crops, especially organic produced Khao Kai Noi rice and maize, sweet corn, garlic, beans, and oil and starch crops.
- Promote native cattle-raising applying improved technology including year-long availability of grass and fodder crops, improved animal health care, value added products, and market development.
- Promote sub-tropical and temperate fruit trees cultivation including pear, peach, chestnut, plum, avocado, and wild tea, by utilizing environmental friendly production systems, post harvest processing technology, and marketing.
- Promote protected forests, production forests and conservation forests at all administrative levels focusing on local participation and economic incentives.
- Support rehabilitation of forests through both forest plantation and natural regeneration.
- Promote conservation and sustainable use of NTFPs and medicinal plants including formation of production and trading groups.
- Establish preventive measures against unsustainable collection and trade of biodiversity, especially by middlemen and international traders.
- Promote value added products through grading, packaging, branding, and marketing.
- Integrate sustainable aquatic and wildlife management with habitat conservation.
- Prioritize endangered species for protection and conservation including establishing fish conservation zones and community and individual ponds.
- Control the use of fishing gears and hunting methods
- Collaborate with private investors to reduce water pollution and negative impacts on aquatic organisms.
- Conserve edible and other insects and their ecosystems
- Raise awareness of beneficial insects playing important roles as pollinators
- Raise awareness on the importance of biodiversity to government, public, and private sectors including students.
- Create effective cooperation among local partners and with other national and international agencies.



PART II

**Biodiversity Strategy and
Action Plan**

2012-2020

**Xieng Khouang
Province**

Part II

Provincial Biodiversity Strategy

Action Plan

1. Introduction

Lao PDR is a landlocked country in Southeast Asia and the Greater Mekong sub-region. Some 80 percent of the population is living in the rural and remote areas dominated by subsistence agriculture.

Xieng Khouang Province has a population of 256,650 (2010) and an area of 5,880 km², bordering Vietnam to the east, Huaphan Province to the northeast, Luang Prabang to the northwest, Vientiane to southwest and Xaysomboun and Bolikhamxay to the south. The province has a mix of plateaus, valleys and mountainous areas. It provides habitats for temperate and sub-tropical ecosystems and species supporting the livelihood of local people.

Xieng Khouang province is administratively divided into eight districts: Pek, Kham, Nonghet, Khoun, Mok, Phoukhout, Phaxay, and Thatom Districts.

The socio-economic development in Xieng Khouang is largely based on exploitation of forests and minerals and significant income is generated from hydropower plants along Ngum River.

Biodiversity refers to the variety of ecosystems, species and genetic resources, including the flora, fauna, fungi, and micro-organisms. Based on ecosystems and their dominant habitats and use, biodiversity is divided into agrobiodiversity, forest biodiversity, wetland biodiversity and so forth.

Xieng Khouang Province possesses unique biodiversity, among others known for Fujian cypress (*Fokienia hodginsii*) and two pine species (*Pinus merkusii* and *P. kesiya*).

The protection of the environment and the natural resources, however, remains a challenge; hence the province has put high priority on conservation and sustainable use of biodiversity and its supporting ecosystems.

2. General Principles

The principles for preparation for both NBSAPs and PBSAPs are laid out by the Convention on Biological Diversity, as follows:

1. Biodiversity in the country is the nation's property, and should be used in proper and sustainable ways, and managed under relevant laws and regulations.
2. The Biodiversity Strategy and Action Plan should be harmonized with socio-economic development plans as well as other provincial sectoral development plans.
3. Biodiversity Strategy and Action Plan development should be based on natural and social conditions as well as the development trends of the province.
4. All development plans have to consider socio-economic value, respect for the environment, biodiversity, traditional knowledge and beliefs of the local people, and the best practices.
5. Sustainable use of biodiversity is the key factor for improving quality of life for local people and poverty alleviation.
6. In addition to in-situ conservation of biodiversity as the first priority action, it must also pay attention to ex-situ conservation especially for endangered species.
7. Conservation and sustainable use of biodiversity should have the cooperation of concerned stakeholders ranging from government to local community levels. Moreover, it

should collaborate with neighboring countries, with sub regional and regional groups, and with international organizations for experience and information exchange.

8. The Biodiversity Strategy and Action Plan has to clearly identify strategies to solve biodiversity issues, regulation issues, and harmonize with other national strategies. Education and public awareness should also be included, as well as efforts to attract foreign investment and cooperation, as important considerations for the provincial government.
9. Development, promotion, improvement, and strict enforcement of relevant laws and regulations are the fundamental measures for preventing loss of biodiversity.
10. Regular education and raising public awareness are very important for biodiversity conservation and sustainable use.
11. Integrating conservation and development is one of many ways to sustainably conserve and manage forests.
12. Development of the biodiversity strategy and action plan has to coordinate with all relevant sectors for participation and wider discussion at all levels from central government to local communities.

3. Biodiversity Vision and Strategy for 2020

3.1 Vision

The vision of the Xieng Khouang PBSAP 2020 is: “To holistically develop Xieng Khouang Province as a lively and attractive tourist destination associated with conservation and sustainable use of biodiversity and its supporting ecosystems”.

3.2 Strategy for 2020

The biodiversity strategy to 2020 for Xieng Khouang Province supports the government's socio-economic development plans, particularly those related to poverty reduction, food security, environmental protection strategies, and stabilization of shifting cultivation.

The strategy divided into five biodiversity “sub-strategies”:

1. Protect the diverse and economically important ecosystems including the species and genetic diversity found therein (5 programs);
2. Integrate comprehensive conservation and sustainable use of biodiversity in accordance with the socio-economic development plan (2 programs);
3. Record indigenous biodiversity knowledge and practices (1 program);
4. Improve education and raise public awareness on value of conservation and sustainable use of biodiversity (3 programs); and
5. Implement provincial biodiversity strategy and action plan 2012-2020 (3 programs).

4. Biodiversity Action Plan for 2015

4.1 General direction

The Action Plan until 2015 for conservation and sustainable use of agrobiodiversity is a key contribution to the socio-economic development and assisting local people, especially the poorest people of Xieng Khouang Province to gradually improve livelihoods and be free from poverty.

4.2 Programs, targets, action plans, and indicators

Although biodiversity targets have been set up at the national level (NBSAP) in both the medium and short terms, some of them directly apply to the province while others are created to match the national targets.

The Xieng Khouang Provincial Action Plan contains five "sub-strategies" each with a number of programs which is further divided into targets for the year 2020 and the year 2015. Each of the 2015 targets have a number of action plans with corresponding indicators.

Sub-strategy 1: Protect diverse and economically important eco-systems, including the species and genetic diversity found therein

Program	Target		Action Plan 2015	Indicator
	2020	2015		
1.1 Protection of forest ecosystems	6	12	31	31
1.2 Protection of wetland ecosystems	2	3	7	7
1.3 Protection of agricultural ecosystems	4	6	34	34
1.4 Protection of urban ecosystems	3	3	8	8
1.5 Conservation of indigenous species and varieties	3	5	18	18

Sub-strategy 2: Promote comprehensive and sustainable conservation and Sustainable use of biodiversity through socio-economic development planning process

Program	Target		Action Plan 2015	Indicator
	2020	2015		
2.1 Mainstreaming biodiversity into provincial and district development plans	1	3	6	6
2.2 Promotion of environmentally sound investments in ecosystems	2	3	5	5

Sub-strategy 3: Record traditional biodiversity knowledge and practices

Program	Target		Action Plan 2015	Indicator
	2020	2015		
3.1 Recording biodiversity knowledge and practices	3	3	7	7

Sub-strategy 4: Enhance education and raising public awareness on the value and sustainable use of biodiversity

Program	Target		Action Plan 2015	Indicator
	2020	2015		
4.1 Developing capacity on biodiversity	3	4	5	5
4.2 Raising public awareness	1	1	3	3
4.3 Improving biodiversity education	1	1	2	2

Sub-strategy 5: Implement provincial biodiversity strategy up to 2010 and action plan to 2015

Program	Target		Action Plan 2015	Indicator
	2020	2015		
5.1 Reporting and implementing provincial strategy and action plan	1	1	3	3
5.2 Coordination mechanism for implementing the PBSAP	2	2	3	3
5.3 Mobilization of funds	1	1	4	4

SUB-STRATEGY 1: PROTECT DIVERSE AND ECONOMICALLY IMPORTANT ECOSYSTEMS, INCLUDING THE SPECIES AND GENETIC DIVERSITY FOUND THEREIN

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
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PROGRAMME 1.1: PROTECTION OF FOREST ECOSYSTEMS

<u>Target 1.1.1</u>	<u>Sub target 1.1.1.1</u>	<u>Action plan 1.1.1.1 (a)</u>				
Forest cover increased to at least to 70% by the end of 2020.	Forest cover increased to 65% by the end of 2015.	Strengthening technical expertise at provincial and district levels in order to terminate slash and burn cultivation.	- PAFO - PoNRE	2012 - 2015	- Province - Projects	- Technical staff at province and district levels are able to apply new knowledge.
		<u>Action plan 1.1.1.1(b)</u> Promote job creation for local people in village forests and agroforestry production.	- PAFO - PoNRE	2012 - 2015	- Province - Nam Ngum Watershed Project - TABI - Other projects	- Village's forest work is improved and local people practice agroforestry.
		<u>Action plan 1.1.1.1 (c)</u> Set-up appropriate measures for the utilization of wood from forests areas for charcoal and poles.	- PAFO - PoNRE	2012 - 2015	- Province	- The provincial authority has information and advice for wood utilization for charcoal and poles.
		<u>Action plan 1.1.1.1 (d)</u> Review policies and regulations related to collection and trading of NTFPs at provincial and district levels.	- PAFO - PoNRE - PI&C	2013	- Province	- Revised provincial regulations of on collection and trading of forest products.

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
		Action plan 1.1.1.1 (e) Promote value added and market development of NTFPs	- PAFO - PoNRE - PI&C	2012 - 2020	- SADU Project - Nam Ngum Watershed Project - Other projects	- Increased community business units and trading of NTFP.
		Action plan 1.1.1.1 (f) Promote the sustainable management and use of NTFPs.	- PAFO - PoNRE - PI&C	2012 - 2015	- SADU Project - Nam Ngum Watershed Project - Other projects	- Management plans prepared for the province and districts.
	Sub target 1.1.1.2	Action plan 1.1.1.2 (a) Review 154 villages which have completed land and forest allocation	- PAFO	2012 - 2020	- Province	- Provincial meeting reports.
	Completed the basic land and forest allocation (land use plans at district level).	Action plan 1.1.1.2 (b) Complete land and forest allocations in 358 villages (8-9 villages/district).	- PAFO	2012 - 2020	- Province - TABI project - Nam Ngum Watershed Project - ABP project - Other projects	- Reports and village based land use maps.
		Action plan 1.1.1.2 (c) Establish pilot projects for district biodiversity management planning in Phoukhout, Khoun and Pek Districts.	- PAFO - PoNRE	2013 - 2015	- Province - TABI Project - ABP project - Nam Ngum Watershed Project - Other projects	- Management plan and sustainable use of biodiversity in Phoukhout, Khoun and Pek Districts.

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
	Sub target 1.1.1.3	Action plan 1.1.1.3 (a) Improve/prepare and enforce regulations on forest fire protection.	- PAFO - PoNRE	2012 - 2013	- Province	- Regulations adopted and enforced.
	Forest fires are controlled and prevented.	Action plan 1.1.1.3 (b) Strengthening the capacity of provincial and district forest officers in controlling areas with risk of forest fire.	- PAFO - PNRE	2013 - 2015	- Province - Other projects	- Trained provincial and district staffs to control forest fires.
		Action plan 1.1.1.3 (c) Carry out village awareness activities to prevent forest fires.	- PAFO - PoNRE - PIC&T	2013 - 2015	- Province - Other projects	- Forest fire incidents reduced.
	Sub target 1.1.1.4	Action plan 1.1.1.4 (a) Survey and select a suitable area for the provincial botanical garden.	- PAFO - PoNRE	2013 - 2014	- Province	- Survey report and selected area adopted by the Province.
	Provincial Botanical Garden established.	Action plan 1.1.1.4 (b) Design and manage the provincial botanical garden.	- PAFO - PoNRE	2013 - 2014	- Province	- Design and management plan adopted by the Province.
Target 1.1.2	Sub target 1.1.2.1	Action plan 1.1.2.1 (a) Survey and map suitable areas for conservation.	- MoNRE	2012 - 2015	- Province - Forest Development Fund - Other projects	- Protected area maps with clear boundaries, approved by the Province.
Management plans for national, provincial and district protected areas prepared.	Provincial Protection forests (Tor 10) upgraded as the national protection forest.					

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
		Action plan 1.1.2.1 (b) Submit proposed letter the National Assembly through Government Office.	- PoNRE	2013 - 2015	- Province - Forest Development Fund	- Top 10 protected areas are adopted as national protection forests
	<u>Sub Target 1.1.2.2</u> At least 6 provincial protection forest management plans are completed.	<u>Action plan 1.1.2.2 (a)</u> Survey and determine boundaries of six provincial protected forests.	- PoNRE	2013 - 2014	- Province - Forest Development Fund - ABP project - Other projects	- Provincial Protection forest maps which clear boundaries adopted.
		<u>Action plan 1.1.2.2 (b)</u> Establish three check-points for Phou Sabot Pong Chong (PSPC) national protected forest.	- PoNRE	2013 - 2014	- Province - Forest Development Fund - Other projects	- Protected area posts (check-points) built and effectively used.
		<u>Action plan 1.1.2.2 (c)</u> Identify flora and fauna in PSPC national protection forest.	- NUoL - NAFRI	2013 - 2014	- Province - ABP project - Forest Development Fund - Other projects	- Reports of flora and fauna in PSPC national protection forest.
<u>Target 1.1.3</u>	<u>Sub target 1.1.3.1</u>	<u>Action plan 1.1.3.1 (a)</u> Survey, map and set-up demarcation boundary posts.	- PoNRE	2013 - 2015	- Province - Forest Development Fund - Other projects	- Forest maps with clear boundaries.
Management plans for national and district protected forests	Management plans for two national protection forests developed.					.

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
developed.		Action plan 1.1.3.1 (b) Develop participatory protected area management plans for two protection forests.	- PoNRE	2013 - 2015	- Province - Forest Development Fund - Other projects	- Participatory management plans for 2 protection forests developed and adopted by the province.
	Sub target 1.1.3.2	Action plan 1.1.3.2 (a) Survey, map and set-up demarcation boundary posts.	- PoNRE	2013 - 2015	- Province - Forest Development Fund - ABP project - Other projects	- Maps with clear boundaries.
	Five district Protection Forest Management plans prepared.	Action plan 1.1.3.2 (b) Develop participatory provincial protection forest management plans for 5 sites.	- PoNRE	2013 - 2015	- Province - Forest Development Fund - Other projects	- Participatory forest management plans adopted by the province.
Target 1.1.4 Management plan for national production forests prepared.	Sub target 1.1.4.1 Management plan for 2 national production forests prepared.	Action plan 1.1.4.1 (a) Survey and set-up demarcation boundary posts.	- PAFO	2013 - 2015	- Province - Forest Development Fund - Other projects	- Maps which clear boundaries.
		Action plan 1.1.4.1 (b) Develop participatory management plans at two sites.	- PAFO	2013 - 2015	- Province - Forest Development Fund - Other projects	- Participatory management plans approved by the Province.

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
Target 1.1.5 Regenerated 100,000 ha natural forest and 50,000 ha forest plantation promoted.	Sub target 1.1.5.1 Natural forest 50,000 ha regenerated	Action plan 1.1.5.1 (a) Identify district forest regeneration areas of 5,000-10,000 ha and prepare district management plans.	- PAFO - PoNRE	2012 - 2015	- Province - Forest Development Fund - Other projects	- Management plans of regeneration of natural forests developed in every district.
	Sub target 1.1.5.2 25,000 ha of trees planted in community forests.	Action plan 1.1.5.2 (a) Promote tree plantations by households and government and Non-government Organizations.	- PAFO - PoNRE	2012 - 2015	- Province - Forest Development Fund - Other projects - Private sector	- Increased forest plantation in districts.
		Action plan 1.1.5.2 (b) Increase tree seedling production up to 30,000,000 seedlings.	- PAFO - PoNRE - Private sector	2012 - 2015	- Province - Forest Development Fund - Other projects - Private funds	- The number of nursery sites and tree seedling production increased.
Target 1.1.6 Reduced forest loss caused by fire wood collection and release of carbon dioxide demonstrated in at least 4 districts.	Sub target 1.1.6.1 Renewable energy to reduce firewood collection in at east two districts promoted.	Action plan 1.1.6.1 (a) Support the establishment of biogas plants and animal raising.	- PAFO - PE&M	2012 - 2015	- TABI project - SNV project - Other projects	- The number of households using biogas increased.
		Action plan 1.1.6.1 (b) Promote renewable energy such as micro-hydro and solar power.	- PE&M	2012 - 2015	- Other projects	- The number of households using renewable energy increased.

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
		Action plan 1.1.6.1 (c) Support farmers to grow bio-diesel crops in Mok and Pha Xay Districts.	- PAFO - PE&M	2012 - 2015	- Other projects	- Community models demonstrated producing biodiesel production

PROGRAMME 1.2: PROTECTION OF WETLAND ECOSYSTEMS

<u>Target 1.2.1</u>	<u>Sub target 1.2.1.1</u>	<u>Action plan 1.2.1.1 (a)</u>				
Fish conservation zones for indigenous fish species across the province established.	New and old fish conservation zones managed.	Establish and demonstrate fish conservation zones with emphasis on conservation of Indigenous fish species.	- PAFO - PRF	2012 - 2015	- Province - PRF - ABP project	- The number of well-managed fish conservation zones increased.
		Action plan 1.2.1.1 (b) Support management of community fish ponds, swamps, etc.	- PAFO - PRF	2012 - 2015	- Province - PRF	- Community fish ponds & wetlands properly managed.
	<u>Sub target 1.2.1.2</u>	Action plan 1.2.1.2 (a) Establish local fisheries regulations.	- PAFO - PRF	2012 - 2015	- Province - PRF	- Management regulations at village or village cluster level approved by districts.
	Local fisheries and aquatic resources management committees established.	Action plan 1.2.1.2 (b) Disseminate and enforce local fisheries regulations and evaluate the implementation annually.	- PAFO - PRF	2012 - 2015	- Province - ABP project - PRF	- Annual reports on the status of implementation of local fisheries regulations.

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
Target 1.2.2	Sub target 1.2.2.1	Action plan 1.2.2.1 (a) Survey and obtain data on wetlands and water reservoirs in every district.	- PoNRE	2012 - 2015	- Province - ABP project - Other projects	- Survey reports on wetlands and/or reservoirs in each district.
At least 16 wetland and reservoir management plans prepared throughout province.	At least one wetland or reservoir management plan per district established.	Action plan 1.2.2.1 (b) Develop and implement the district wetland and/or reservoir management plans.	- PoNRE	2012 - 2015	- Province - ABP project - Other projects	- Wetland and/or reservoir management plans approved by districts.
		Action plan 1.2.2.1 (c) Built community information center for exchanging information about wetland management.	- PoNRE	2012- 2015	- Province - Projects	New community centers well managed.

PROGRAMME 1.3: PROTECTION OF AGRICULTURAL ECOSYSTEMS

Target 1.3.1:	Sub target 1.3.1.1	Action plan 1.3.1.1 (a) Produce district soil fertility maps for remaining districts.	- PoNRE - PAFO	2012 - 2015	- Province - Vietnam	- District soil fertility maps developed.
Agricultural land protected and maintained.	District agricultural land use maps completed.	Action plan 1.3.1.1 (b) Prepare district agricultural land use database, including areas of rice, home gardens, grasslands, fishponds, and others.	- PoNRE - PAFO	2012 - 2015	- Province	- District agricultural land use data is available.
		Action plan 1.3.1.1 (c) Complete all village land use planning.	- PoNRE - PAFO	2012 - 2015	- Province	- Land use planning maps available for whole province.

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
	Indigenous knowledge in soil conservation and soil improvement promoted.	Action plan 1.3.1.1 (d) Complete urban land use planning.	- PoNRE	2012 - 2015	- Province	- Districts town land use maps available.
		Sub target 1.3.1.2 Action plan 1.3.1.2 (a) Promote organic fertilizers for soil protection (e.g. for organic production).	- PAFO	2012 - 2015	- Province - TABI project - ABP project - SAMADP Project - Other projects	- Indigenous knowledge reported in annual PAFO report
		Action plan 1.3.1.2 (b) Promote conservation and sustainable production of indigenous rice varieties (e.g. Khao Kai Noi).	- PAFO - DAFOs	2012 - 2015	- Province - TABI project - ABP project - Other project	- Cultivation areas expanded and production increased.
		Action plan 1.3.1.2 (c) Promote conservation and sustainable production of green algae.	- PAFO - DAFOs - PI&C	2012 - 2015	- Province - TABI project - Other projects	- Algae production groups established and algae quality improved.
		Target 1.3.2 Sub target 1.3.2.1 Action plan 1.3.2.1 (a) Develop and implement agricultural and forestry training programs for farmers.	- PAFO - DAFOs	2012 - 2015	- Province - TABI project - Other project	- Producer and farmer groups trained.
Extensive support services to farmers including agro-biodiversity provided by Technical Service Centers (TSCs).	TSC services improved to farmers.	Action plan 1.3.2.1 (b) Develop a study tour program for exchange of knowledge and lessons learned among farmers.	- PAFO - DAFO	2012 - 2015	- Province - TABI project - ABP project - Other projects - PRF	- Study tours for knowledge exchange organized and good practices documented.
		Action plan 1.3.2.1 (c) Strictly control the trading and use of pesticides.	- PoNRE - PAFO - PI&C	2012 - 2015	- Province	- Reports on trading of banned pesticides.

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
		Action plan 1.3.2.1 (d) Promote the use of bio-extraction for bio-pesticides and fertilizers.	- PAFO - PS&T	2012 - 2015	- Province - TABI project - ABP project - Other projects - PR	- Bio-pesticides produced by farmers.
		Action plan 1.3.2.1 (e) Promote rainy season vegetable cultivation.	- PAFO - DAFO	2012 - 2015	- Province - TABI project - Other projects - PRF	- Sufficient vegetables in rainy season produced.
		Action plan 1.3.2.1 (f) Promote the cultivation of single seedling in all districts.	- PAFO - DAFO	2012 - 2015	- Province - TABI project - ABP project - Other projects - PRF	- Single seedling rice cultivation area increased.
		Action plan 1.3.2.1 (g) Promote of agro-ecological concepts in all districts.	- PAFO - DAFO - PI&C	2012 - 2015	- Province - TABI project - Other projects - PRF	-The use of agro-ecological technics increased in all districts.
		Action plan 1.3.2.1 (h) Promote the mulberry plantations and sericulture.	- PAFO - DAFO - PI&C	2012 - 2015	- Province - TABI project - Other projects - PRF	- The area of mulberry cultivation and silk production increased.
		Action plan 1.3.2.1 (i) Promote temperate and subtropical fruits such as pear, peach and passion fruit in Pek, Pha Xay and Nong Het districts.	- PAFO - DAFO - PI&C	2012 - 2015	- Province - TABI project - Other projects - PRF	- Production areas and yields increased.

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
		Action plan 1.3.2.1 (j) Promote wild tea and local coffee growing in Khoun (Phou Sa) and Pek District.	- PAFO - DAFO - PI&C	2012 - 2015	- Province - TABI project - Other projects - PRF	- The number of wild tea local coffee production areas and yields increased.
		Action plan 1.3.2.1 (k) Facilitate farmers in organizing producer groups, marketing and access to funding.	- PAFO - DAFO - PI&C	2012 - 2015	- Province - TABI project - Other projects - PRF	- Market accessed and funding made available
		Action plan 1.3.2.1 (l) Identify major diseases in rice, cassava, chestnuts, etc.	- PAFO	2013 - 2014	- Province - TABI project - Other projects	- Report on major diseases produced.
	Sub target 1.3.2.2	Action plan 1.3.2.2 (a) Repair damaged irrigation schemes.	- PAFO - DAFOs	2012 - 2015	- Province - Projects	- Damaged irrigation schemes repaired and used effectively.
	Secured water supply for crops in rainy and dry seasons.	Action plan 1.3.2.2 (b) Survey and design new irrigation schemes.	- PAFO - DAFOs	2012 - 2015	- Province - Projects	- New irrigation schemes established.
		Action plan 1.3.2.2 (c) Strengthened irrigation management through water user groups.	- PAFO - DAFOs	2012 - 2015	- Province - Projects	- Effective irrigation by water user groups.
Target 1.3.3	Sub target 1.3.3.1	Action plan 1.3.3.1 (a) Establish livestock raising groups.	- PAFO - DAFOs - PI&C	2012 - 2015	- Province - Projects	- Livestock raising groups established.
Large animal raising promoted.	Increase large animal production cattle e.g. in Pek,					

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
Phoukhout and Pha Xay Districts.	.	Action plan 1.3.3.1 (b) Promote commercial cattle farms.	- PAFO - DAFOs - PI&C	2012 - 2015	- Private investment both domestic and foreign.	- Large cattle farms established in targeted districts.
		Action plan 1.3.3.1 (c) Train producer groups in cattle raising.	- PAFO - DAFOs	2012 - 2015	- Province - Projects	- Cattle producers effectively applying improved technology.
		Action plan 1.3.3.1 (d) Provide improved knowledge and skills to veterinary staff and farmers.	- PAFO - DAFOs	2012 - 2015	- Province - Projects	- Veterinary staff and farmers with improved knowledge and skills.
		Action plan 1.3.3.1 (e) Cattle fodder production promoted.	- PAFO - DAFOs	2012 - 2015	- Province - Projects	- Areas for fodder production increased in targeted districts.
		Action plan 1.3.3.1 (f) Animal feed-factories established.	- PAFO - PI&C	2013 - 2015	- Private sector	- Factories providing animal feed to farmers.
		Action plan 1.3.3.1 (g) Promote livestock breeding by farmers.	- PAFO - DAFOs	2012 - 2015	- Province - Projects	- Livestock breeding improvement done by farmers.
		Action plan 1.3.3.1 (h) Prevent and control livestock diseases and movements.	- PAFO - DAFOs	2012 - 2015	- Province - Projects	- Number of infectious diseases and livestock deaths decreased.
		Action plan 1.3.3.1 (i) Develop water storages for livestock and irrigation.	- PAFO - DAFOs	2012 - 2015	- Province - Projects	- Year round water storages for livestock constructed.

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
Target 1.3.4	Sub target 1.3.4.1	Action plan 1.3.4.1 (a) Promote rice-fish & aquaculture	- PAFO - DAFOs - ABP	2012 - 2015	- Province - Projects	- Aquaculture and rice-fish cultivation Increased.
Aquatic production promoted	Increased production of fish and other aquatic animals.	Action plan 1.3.4.1 (b) Promote fingerling production of indigenous fish species.	- PAFO - DAFOs	2012 - 2015	- Province - Private - Projects	- Fingerling production of indigenous fish species increased.
		Action plan 1.3.4.1 (c) Promoting ponds for Indigenous species raising.	- PAFO - DAFOs	2012 - 2015	- Province - Private - Projects	- Number of ponds increased.

PROGRAMME 1.4: PROTECTION OF URBAN ECOSYSTEMS

Target 1.4.1	Sub target 1.4.1.1	Action plan 1.4.1.1 (a) Collect information on solid waste and wastewater.	- PoNRE	2013 - 2015	- Province - Urban development fund	- Various survey reports made.
Models piloted for solid waste and waste water management in as one in Phonesavan and five in district towns.	Established solid waste and waste water treatment plants for Pek, Phoukhout, Kham and Khoun Districts.	Action plan 1.4.1.1 (b) Develop participatory district solid waste and wastewater treatment management plans.	- PoNRE - PPW&T	2013 - 2015	-Province - Urban development fund	- Solid waste and wastewater treatment plans adopted by districts and the Province.
		Action plan 1.4.1.1 (c) Disseminate and conduct regular public awareness campaigns on solid waste and wastewater treatment management.	- PoNRE - PIC&T	2013 - 2015	- Province - Urban development fund	- Provincial capital and districts towns are green, clean and beautiful.

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
		Action plan 1.4.1.1 (d) Monitor water quality in Phonsavanh and district towns.	- PoNRE - PPH	2013 - 2015	- Province - Urban development fund	- Water quality of accepted standard.
<u>Target 1.4.2</u>	<u>Sub target 1.4.2.1</u>	Action plan 1.4.2.1 (a) Prepare eco-friendly design for Nongpet Junction, Kham District.	- PoNRE - PPW&T	2013 - 2015	- Province - Urban development fund	- Eco-friendly design prepared for Nongpet Junction.
Eco-friendly urban plans developed.	Improved design for provincial and district urban planning.					
<u>Target 1.4.3</u>	<u>Sub target 1.4.3.1</u>	Action plan 1.4.3.1 (a) Identify and prioritize key watersheds and ecosystems providing services to towns.	- PoNRE - PPW&T - PAFO	2013 - 2015	- Province	- Reports of significant ecosystems/ watersheds in and around cities produced
Protection and rehabilitation of watersheds and ecosystems urban plans implemented.	Protection and rehabilitation of watersheds ecosystems incorporated into the urban development plans.	Action plan 1.4.3.1 (b) Develop ecosystem/watershed management plans important for urban areas.	- PoNRE - PPW&T - PAFO	2013 - 2015	- Province	- Regulations and management plans of key ecosystems/ watersheds for urban areas approved.
		Action plan 1.4.3.1 (c) Manage water quality of Kat, Kho, San and other rivers.	- PoNRE	2013 - 2015	- Province	- Water quality at accepted standards.

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
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PROGRAMME 1.5: CONSERVATION OF INDIGENOUS SPECIES AND VARIETIES

<u>Target 1.5.1</u>	<u>Sub target 1.5.1.1</u>	<u>Action plan 1.5.1.1 (a)</u>				
Indigenous plants, animals and fungi of high risk of extinction protected.	Unique indigenous rice varieties protected.	Promote Khao Kai Noi rice cultivation.	- PAFO - DAFOs - PI&C	2012 - 2015	- Province - Projects	- Area and productivity of Khao Kai Noi rice increased.
		Action plan 1.5.1.1 (b) Expand markets for Khao Kai Noi rice.	- PAFO - PI&C	2012 - 2015	- Province - TABI project - ABP project - Projects	- Trading volumes increased.
<u>Target 1.5.2</u>	<u>Sub target 1.5.2.1</u>	<u>Action plan 1.5.2.1(a)</u>				
Endangered plants, mushrooms and animal wildlife species protected.	Significant forests protected.	Develop management plans for Hing Hom (<i>Dacrydium elatum</i>) forests in Mok District.	- PoNRE - PAFO	2013 - 2014	- Province - Projects	- Management plans to protect Hing Hom (<i>Dacrydium elatum</i>) forests adopted by involved districts.
		Action plan 1.5.1.2(b) Develop Long Leng forest (<i>Fokienia hodginsii</i>) management plan in Mok, Pha Xay and Khoun Districts.	- PoNRE - PAFO	2013 - 2014	- Province - Projects	- Long Leng forest (<i>Fokienia hodginsii</i>) management plan adopted by involved districts.
		Action plan 1.5.1.2(c) Develop Mai Dou Pa forests (<i>Pterocarpus macrocarpus</i>) forest management plans in Nong Het and other districts.	- PNRE - PAFO	2014 - 2015	- Province - Projects	- Mai Dou Pa Forest (<i>Pterocarpus macrocarpus</i>) management plans adopted by involved districts.

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
	Sub target 1.5.2.2	Action plan 1.5.2.2 (a) Prepare sustainable harvest plan and market development for Het Wai (<i>Tricholoma fulvocastaneum</i>) and other endangered mushrooms.	- PAFO - PI&C	2012 - 2015	- Province - ABP project - Private sector - Other projects	- Regulatory management is adopted, processing and packaging improved.
	Promotion of sustainable use of NTFPs.	Action plan 1.5.2.2.(b) Promote added value of palm fruits, Cardamom and Mak Ka.	- PAFO - PI&C	2012- 2015	- Province - Other projects	- Guide for processing and packaging are disseminated.
		Action plan 1.5.2.2.(c) Promote added value for wild tea for Kham District.	- PAFO - PI&C	2012 - 2015	- Province - ABP project - Other projects	- Guide for processing and packaging are disseminated for wild tea.
	Sub target 1.5.2.3	Action plan 1.5.2.3 (a) Develop a Tiger (<i>Panthera tigris</i>) management plan for Phoukhout district.	- PAFO/DAFO -PoNRE/District NRE Office	2013 - 2014	- Province - Projects	- Tiger (<i>Panthera tigris</i>) management plan adopted by province.
	Wildlife of high risk of extinction protected.	Action plan 1.5.2.3.(b) Develop a Gibbon (<i>Hylobates spp.</i>) management plan for Tha Thom District.	- PAFO/DAFO -PoNRE/District NRE Office	2013	- Province - Projects	- Gibbon (<i>Hylobates spp.</i>) management plan adopted by the Province.
		Action plan 1.5.2.3.(c) Develop a Banteng (<i>Bos javanicus</i>) management plan for Phoukhout District.	- PAFO/DAFO -PoNRE/District NRE Office	2013- 2014	- Province - Projects	- Banteng (<i>Bos javanicus</i>) management plan adopted by province.
		Action plan 1.5.2.3.(d) Develop Lao Newt (<i>Paramesotriton laoensis</i>) management plan for Phoukhout and other districts.	- PAFO/DAFO -PoNRE/District NRE Office	2013- 2014	- Province - Projects	- Lao Salamander (<i>Paramesotriton laoensis</i>) management plan adopted by the

Target up to 2020	Target up to 2015	Action plan up to 2015	Implementing Agency	Time Frame	Funding	Indicator
						Province.
		Action plan 1.5.2.3.(e) Develop a Great Hornbill (<i>Buceros bicornis</i>) management plan for Tha Thom District.	- PAFO/DAFO -PoNRE/District NRE Office	2013 - 2014	- Province - Projects	- Great Hornbill (<i>Buceros bicornis</i>) management plan adopted by the Province.
Target 1.5.3	Sub target 1.5.3.1	Action plan 1.5.3.1 (a) Select areas for inventory Surveys.	- PPH	2012 - 2013	- Province - Projects	- Survey areas prioritized.
Conservation and sustainable use of medicinal plants promoted.	Inventories of medicinal plants completed and prioritized for conservation and sustainable use.	Action plan 1.5.3.1.(b) Record medicinal plants, their use as well as potential domestic and international markets.	- PPH	2013 - 2014	- Province - ABP project - Other project	- Medicinal plant handbooks prepared.
		Action plan 1.5.3.1.(c) Update healer list and promote traditional knowledge.	- PPH	2013 - 2014	- Province - Projects	- Provincial Healer list updated and traditional knowledge disseminated.
		Action plan 1.5.3.1 (d) Encourage local people to sustainably manage medicinal plants and to domesticate most economic species.	- PPH - PAFO - PI&C	2013 - 2014	- Province - ABP project - Other projects	- Medicinal plants domesticated and increasingly traded.
		Action plan 1.5.3.1 (e) Improve the Medicinal Plants Garden in Kham District.	- PPH	2013 - 2014	- Province - Projects	- Propagation of medicinal plants increased at medicinal Plants Garden in Kham District

SUB-STRATEGY 2: PROMOTE A COMPREHENSIVE AND SUSTAINABLE CONSERVATION OF BIODIVERSITY THROUGH THE SOCIO-ECONOMIC DEVELOPMENT PLAN PROCESS

Target up to 2020	Target up to 2015	Action plans up to 2015	Implementing Agency	Time frame	Funding source	Indicator
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PROGRAMME 2.1: MAINSTREAMING BIODIVERSITY INTO PROVINCIAL AND DISTRICT DEVELOPMENT PLANS

Target 2.1.1	Sub target 2.1.1.1	Action plan 2.1.1.1 (a)				
Biodiversity Action Plan mainstreamed into provincial sectoral plans.	Biodiversity Action Plan mainstreamed into sectoral annual plans.	Organize yearly sector Meetings to mainstream the Biodiversity Action Plans into annual work plans.	- PoNRE - PAFO	2012 - 2015	- Province	- Biodiversity Action Plan mainstreamed into provincial and district sectoral annual plans.
		Action plan 2.1.1.1 (b) Demonstrate “one pilot per district” to show how the (agro) value of biodiversity can contribute to poverty alleviation.	- PRF office - PoNRE - PAFO	2012 - 2015	- Province - ABP project - Other projects - PRF	- Pilots on (agro) biodiversity value included in district poverty reduction plans
		Action plan 2.1.1.1 (c) Organize domestic and international study tours.	- PoNRE - PAFO	2012 - 2015	- Province - Projects - PRF	- Study tours organized and gained knowledge applied.
	Sub target 2.1.1.2	Action plan 2.1.1.2 (a) Disseminate models on best practices on conservation and sustainable use of biodiversity to local media.	- PNRE - PAFO - PIC&T	2012 - 2015	- Province - ABP project - Other projects - PRF	- Successful models disseminated to local media.
	Achievements from best models of conservation and sustainable use of biodiversity disseminated.					

Target up to 2020	Target up to 2015	Action plans up to 2015	Implementing Agency	Time frame	Funding source	Indicator
	Sub target 2.1.1.3	Action plan 2.1.1.3 (a) Develop integrated eco-tourism tour packages through a combination of nature, history, cultures and agriculture.	- Provincial Tourism office - Private sector	2012 - 2015	- Province - Projects - Private funds	- Developed tour packages including ecotourism, history, cultures and agriculture.
	Potential of biodiversity related eco-tourism utilized.	Action plan 2.1.1.3 (b) Organize provincial biodiversity events/festivals to promote tourism (e.g. World Food Day and International Biodiversity Day).	- PoNRE - PAFO - Provincial Tourism Office	2012 - 2015	- Province - Projects - Private funds	- Reports of provincial biodiversity events produced.

PROGRAMME 2.2: PROMOTION OF ENVIRONMENTALLY SOUND INVESTMENTS

Target 2.2.1	Sub target 2.2.1.1	Action plan 2.2.1.1 (a)				
Land use plans at district, village cluster and village levels aligned with biodiversity/ ecosystem related plans.	Use lessons learned from TABI to further develop land use in village and village cluster levels.	Action plan 2.2.1.1 (a) Organize consultation meetings for sharing experiences regarding land use planning supported by TABI.	- PoNRE - PAFO	2012 - 2013	- TABI - ABP project	- Successful experiences applied by stakeholders.
		Action plan 2.2.1.1 (b) Develop a land use planning handbook with biodiversity/eco-system focus.	- PoNRE - PAFO	2012 - 2013	- PAFO - TABI project	- Land use planning handbook developed and distributed.

Target up to 2020	Target up to 2015	Action plans up to 2015	Implementing Agency	Time frame	Funding source	Indicator
Target 2.2.2 Biodiversity conservation promoted (PR) within the industrial sector.	Sub target 2.2.2.1	Action plan 2.2.2.1 (a) Encourage the industrial sector to contribute to forest conservation and rehabilitation.	- PI&C	2012 - 2015	- Province	- Contribution to forest conservation and rehabilitation from industrial sectors increased.
		Action plan 2.2.2.1 (b) Promote the industrial sector to support schools, hospitals, roads, clean water, infrastructure, etc.	- PI&C	2012 - 2015	- Province	- Involvement of industrial sector in social responsibility increased.
	Sub target 2.2.2.2	Action plan 2.2.2.2 (a) Strengthening the capacity of concerned agencies capacity to support private investments in agro-forestry sector.	- DPI	2013 - 2015	- Province	- Provincial staff able to lead, evaluate and monitor the private investments.
	Strengthening the capacity of provincial investment committee to lead, evaluate and monitor private investments.					

SUB-STRATEGY 3: RECORD TRADITIONAL BIODIVERSITY KNOWLEDGE AND PRACTICES

Targets up to 2020	Targets up to 2015	Action plans up to 2015	Implementing Agencies	Time frame	Financial source	Indicator
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PROGRAMME 3.1: RECORDING OF BIODIVERSITY KNOWLEDGE AND PRACTICES

<p>Target 3.1.1</p> <p>Indigenous peoples belief and knowledge on practices of conservation and sustainable use of biodiversity recorded.</p>	<p>Target 3.1.1.1</p> <p>Traditional beliefs and knowledge of indigenous peoples practices of conservation and sustainable use of bio-diversity documented.</p>	<p>Action plan 3.1.1.1 (a)</p> <p>Record information on traditional knowledge, beliefs and practices on conservation and sustainable use of (agro) biodiversity.</p>	<ul style="list-style-type: none"> - PoNRE - PAFO - PPH 	2012 - 2015	<ul style="list-style-type: none"> - TABI project - ABDI project - Other projects 	<ul style="list-style-type: none"> - Documents on traditional knowledge and beliefs on (agro) biodiversity developed.
		<p>Action plan 3.1.1.1 (b)</p> <p>Disseminate information on traditional knowledge, practices and beliefs.</p>	<ul style="list-style-type: none"> - PoNRE - PAFO - PPH S 	2013 - 2015	<ul style="list-style-type: none"> - TABI project - ABP project - Other projects 	<ul style="list-style-type: none"> - Curriculum and handbooks developed.
<p>Target 3.1.2</p> <p>Conduct awareness raising for provincial staff and local people to understand Access and Benefit Sharing (ABS) principles arising from the use of biodiversity.</p>	<p>Sub target 3.1.2</p> <p>Acquired knowledge to provincial sector leaders on Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Benefit Sharing (ABS) arising from the use of the Biodiversity.</p>	<p>Action plan 3.1.2.1 (a)</p> <p>Conduct technical seminars for government staff on the Nagoya Protocol on ABS at provincial and district levels.</p>	<ul style="list-style-type: none"> - PS&T - PoNRE 	2013 - 2015	<ul style="list-style-type: none"> - ABP project 	<ul style="list-style-type: none"> - Government staff and local people understand the provisions of Nagoya Protocol on ABS.
		<p>Action plan 3.1.2.1 (b)</p> <p>Establish and exchange experience of pilot districts on the implementation of the ABS.</p>	<ul style="list-style-type: none"> - PoNRE - PAFO - PPH 	2013 - 2015	<ul style="list-style-type: none"> - ABP project 	<ul style="list-style-type: none"> - Pilot projects on ABS in potential districts established to exchange experience.

Target 3.1.3	Sub target 3.1.3.1	Action plan 3.1.3.1 (a) Train staff responsible for provincial biodiversity database.	- PoNRE	2013 - 2014	- PoNRE - TABI project - Other projects	- Staff trained and knowledge used.
Established provincial Biodiversity Data Base.	Biodiversity database in PFRM section established.					
		Action plan 3.1.3.1 (b) Provide equipment for provincial biodiversity database work.	- PoNRE	2013	- TABI project - Other projects	- Relevant equipment provided to province.
		Action plan 3.1.3.1 (c) Maintain the (agro) Biodiversity Information Database.	- PoNRE - PAFO	2013 - 2015	- PoNRE - PAFO - TABI project - Other projects	- Data base managed by PoNRE staff.

SUB-STRATEGY 4: IMPLEMENT EDUCATION AND PUBLIC AWARENESS RAISING ON THE VALUE AND CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY

Targets up to 2020	Targets up to 2015	Action plans up to 2015	Implementing Agency	Time frame	Financial source	Indicator
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PROGRAMME 4.1: DEVELOPING CAPACITY ON BIODIVERSITY

Target 4.1.1	Sub target 4.1.1.1	Action plan 4.1.1.1 (a) Develop training curriculum on (agro) biodiversity.	- NUoL - PoNRE	2012 - 2013	- ABP project	- Curriculum used
Capacity on (agro)	Training on biodiversity					

biodiversity planning and management developed.	management and planning in conservation forests for PAFO and PoNRE.		- PAFO			
		Action plan 4.1.1.1 (b)				
		Carry out yearly biodiversity training to government staff.	- NUoL - PoNRE	2013 - 2015	- ABP project	- Knowledge and skills applied.
	Sub target 4.1.1.2	Action plan 4.1.1.2 (a)				
	Advocate value, conservation strategy and sustainable use of biodiversity through local media.	Share curriculum on Biodiversity with media.	- NUoL - PoNRE	2013 - 2015	- ABP project	- Curriculum disseminated by media
		Action plan 4.1.1.2 (b)				
		Conduct information meetings on biodiversity for media.	- NUoL - PoNRE	2013 - 2015	- ABP project	- Biodiversity news reported in media.
		Action plan 4.1.1.2 (c)				
		Organize training to communities on the importance and benefits of the (agro) biodiversity.	- PoNRE - PAFO - PPH	2013 - 2015	- TABI project - Other projects	- Benefits of biodiversity discussed by local communities.

PROGRAMME 4.2: RAISING PUBLIC AWARENESS ON BIODIVERSITY

Target 4.2.1	Sub target 4.2.1.1	Action plan 4.2.1.1 (a)				
		Broadcast lessons from on				- Additional local radio

Increased public awareness raising on biodiversity values in conservation forests.	Conducted awareness raising for local communities in 7 provincial and 2 national conservation forests.	biodiversity conservation from TABI Project.	- PoNRE - PAFO - PIC&T	2013	- TABI project - Other projects	stations established.
		Action plan 4.2.1.1 (b) Encourage individuals and organizations to write about and disseminate (agro) biodiversity issues and news.	- PIC&T	2013 - 2015	- ABP project	- Biodiversity news and topics increased.
		Action plan 4.2.1.1 (c) Establish information boards or centres to present and disseminate information about (agro) biodiversity issues at local level.	- PIC&T	2013 - 2015		- Information boards at village/ village cluster information centers used.

PROGRAMME 4.3: PROMOTE BIODIVERSITY EDUCATION

Target 4.3.1	Sub target 4.3.1.1	Action plan 4.3.1.1 (a)				
Biodiversity values and sustainable use of biodiversity incorporated in school curriculum.	Biodiversity values added to curriculum of formal and non-formal educational institutions.	Develop school curriculum covering Biodiversity.	- PESD	2012 - 2015	- TABI project - ABP project - Other projects	- Local biodiversity curriculum developed and widely used.
		Action plan 4.3.1.1 (b) Encourage schools with school gardens, tree planting, fish conservation, etc.	- PESD	2012 - 2015	- TABI project - Other projects	- Schools with agrobiodiversity demonstration activities.

SUB-STRATEGY 5: PREPARE AND IMPLEMENT PROVINCIAL BIODIVERSITY STRATEGY AND ACTION PLAN

Targets up to 2020	Targets up to 2015	Action plan up to 2015	Implementing Agency	Time frame	Founding source	Indicator
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PROGRAMME 5.1: REPORTING, IMPROVING AND IMPLEMENTING THE PROVINCIAL BIODIVERSITY STRATEGY AND ACTION PLAN.

Target up to 2020	Target up to 2015	Action plans up to 2015	Implementing Agency	Time frame	Founding source	Indicator
Xieng Khouang Province to supported to commit to CBD implementation.	Provincial Biodiversity Strategy and Action Plan (PBSAP), 2011 to 2015 developed	Action plan 5.1.1.1 (a) Assess the provincial biodiversity status.	- PoNRE - PAFO	2012	- ABP	- Provincial biodiversity status assessment prepared.
		Action plan 5.1.1.1 (b) Develop, adopt and implement PBSAP.	- PAFO - PoNRE	2012	- Province - TABI - ABP project - Other projects	- PBSAP developed and adopted.
		Action plan 5.1.1.1(c) Assess status of the implementation of PBSAP, 2011-2015.	- PoNRE - PAFO	2015 - 2016	- ABP project	- Status submitted to Governor and CBD focal point.

PROGRAMME 5.2: COORDINATION MECHANISM FOR IMPLEMENTING THE PBSAP

Target 5.2.1	Sub target 5.2.1.1	Action plan 5.2.1.1 (a) Propose Biodiversity Steering Committee for Approval of the Governor.	- PoNRE - PAFO	2012 - 2013	- TABI project - ABP project	- Approved provincial Biodiversity Steering Committee
Coordination	Approved					

mechanism on conservation and sustainable use of biodiversity established.	Provincial Biodiversity Steering Committee (CBD/ NBSAP /PBSAP/NABP) according designated mandates.	Action plan 5.2.1.1 (b) Carry out regular Biodiversity Steering Committee meetings.	- PoNRE - PAFO	2012 - 2013	- TABI project - ABP project - Other projects	- Minutes of Biodiversity Steering Committee distributed.
<u>Target 5.2.2</u>	<u>Sub target 5.2.2.1</u>	Action plan 5.2.2.1 (a) Discuss biodiversity monitoring with Vietnam along common border.	- Provincial International Cooperation Division	2013 - 2015	- Province	- Exchange visits between two country provinces regularly organized.
Cooperation with neighbouring countries enhanced.	Enhanced cooperation with Vietnam regarding to biodiversity management along common border.	Action plan 5.2.2.1 (b) Control endangered plants and wildlife species trading across borders.	- PoNRE - PAFO	2012 - 2015	- Province	- Annual report from border check-points.

PROGRAMME 5.3: MOBILIZATION OF FUNDS

<u>Target 5.3.1</u>	<u>Sub target 5.3.1.1</u>	Action plan 5.3.1.1 (a) Mobilize funds from government organizations.	-PoNRE - PAFO	2013 - 2015		- Funds from central government increased.
Increased local and international funding for biodiversity	Increased funding support for biodiversity conservation activities (locally	Action plan 5.3.1.1(b) Mobilize funds from the private sector.	- PoNRE - PAFO	2013 - 2015		- Funding from private sector increased.

conservation activities.	and internationally).	Action plan 5.3.1.1 (c) Mobilize international funding.	-PoNRE - PAFO - Provincial Cooperation Division.	2013 - 2015		- International funding increased.
		Action plan 5.3.1.1(d) Encourage government, NPAs, international organizations and private sector to support biodiversity related activities.	- PoNRE	2013 - 2015		- Number of proposals funded.

5. Implementation

5.1 Institutional arrangements

A Provincial Biodiversity Steering Committee, chaired by the Vice Governor will be established based on an agreed mandate and composition. Main implementing partners of the PBSAP are PoNRE and PAFO.

5.2 Monitoring and evaluation

Under the committee, a technical working group will be formed consisting of representatives from various sectors, districts and civil organizations. They will meet at least twice a year to assist in monitoring and following-up on the implementation of the PBSAP. The planned biodiversity information center at PoNRE will provide the groups with required data and information.

The technical working group will report on PBSAP implementation status take part in subsequent PBSAPs and NBSAPs formulations.

5.3 Funding

To ensure that the PBSAP is successfully implemented sufficient funds should be made available. Possible funding sources are:

- ✓ Government funds allocated to the province (7th and 8th NSEDP);
- ✓ Grant aids and soft loans;
- ✓ Contributions from private sector: and
- ✓ Innovative funds such as REDD, PES, Environmental Protection Fund, GEF Small Grants, Forest Rehabilitation and Development fund, etc.

Some funds can easily be accessed as part of ongoing project interventions, but others may require a long process of preparation of proposals. In any event, the province will make serious efforts to seek the afore-mentioned funding sources.

5.4 Domestic and international cooperation

The Provincial Cooperation Division should play a key role in mobilizing funds in close collaboration with provincial and national agencies.

All stakeholders should take part in the implantation of the PBSAP and subsequently disseminate the successful interventions and good practices. Further, it is important to create a cooperative atmosphere among stakeholders and avoiding duplication of efforts (e.g. by organizing round table meetings). In other words effectively utilize scarce resources.

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