



A Rapid Participatory Biodiversity Assessment

Stora Enso Eucalypt Plantation in Southern Lao PDR



Conducted by IUCN (International Union for Conservation of Nature) in Lao PDR

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Executive Summary

The *Rapid Participatory Biodiversity Assessment* was conducted in five districts in Savanakheth and Salavan Provinces, Lao PDR between October and November 2007. The assessment is meant to be used to inform the upcoming Environmental and Social Impact Assessment process (to be completed by Salwood Asia Pacific Pty Ltd.) and to guide planning, management and monitoring decisions for the proposed Stora Enso Eucalypt Plantation. This assessment provides information, analysis and recommendations from an independent third party. It provides information about both potential environmental and social impacts of the proposed plantation collected using scientific processes. It also gives recommendations for avoiding and/or mitigating these impacts. It focuses particularly on the proposed plantation's potential threats to biodiversity, which include increased pressure on forest and wildlife resources, degradation of aquatic habitats and establishment and spread of invasive alien species. It comes to the conclusion that minimizing adverse impacts on biodiversity requires a transparent and inclusive process that recognizes the interdependencies between different components of the mosaic landscapes and the diversity of local peoples. It also suggests that the project could bring significant benefits to local peoples. These benefits should be planned, implemented and monitored within the aforementioned mosaic framework as well. Together, this RPBA and the broader Stora Enso ESIA provide a forum for multi-stakeholder engagement to explore ways of strengthening governance in the plantation sector and demonstrating how a multi-stakeholder approach can lead to equitable and sustainable growth within this rapidly expanding sector in Lao PDR.

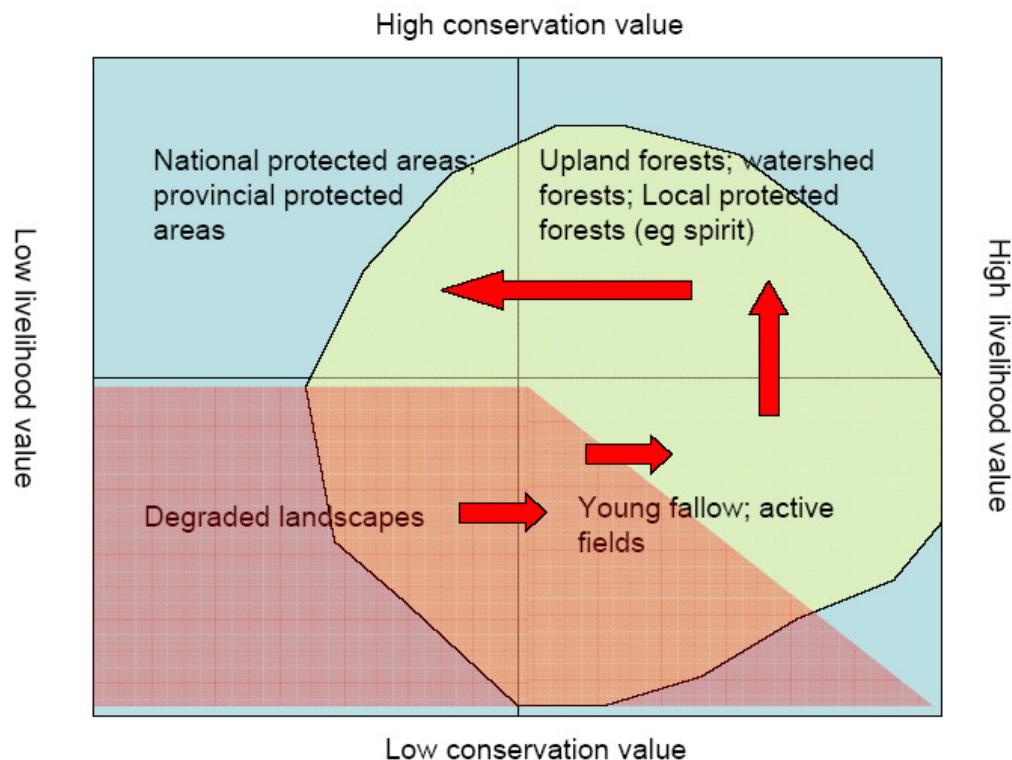


Figure ES.1 Mosaic landscape and linkages between natural and human systems in study area

The key message of the report is summarized by figure ES.1. With particular regard to the linkages between natural and human systems, the project should recognize the tradeoffs between utilization of lower conservation land, the potential direct impacts on livelihoods and the potential indirect impacts

on other areas of higher biodiversity (see Main findings 4, 5 and 6). The red shaded area represents the area that theoretically would be most appropriate for a plantation project; in reality, most of the land identified as suitable by Stora Enso and Burapha falls within this area. The red arrows indicate the direction of pressure that may result from the large scale conversion of lower conservation value land on other components of the landscape mosaic due to the movement of human pressure (ie. harvesting, hunting) from degraded landscapes to areas with higher conservation value.

A transparent and inclusive process that recognizes the interdependencies between different components in the mosaic landscapes and the diversity of local peoples is the only way to ensure that adverse impacts on biodiversity are minimized. The benefits that the project might bring to the local people should be planned, implemented and monitored within this framework as well.

Main findings

1. Landscapes in the potential plantation areas are mosaics with interlinked components containing diverse types and amounts of biodiversity.

Different types of land use are linked across landscapes, and exist through different local natural resource management strategies. Areas of higher biodiversity and lower biodiversity often exist side-by-side, and are managed differently by local communities. The local communities live with different landscape components that fall at various points along the continuum of forest-fallow-field. Various forms of protection (legal, local) exist alongside various levels of management (extensive, intensive).

2. Local communities are poor by socio-economic development standards, but dynamic and diverse in their livelihood adaptations.

With high ethnic diversity, there is a rich base of local knowledge about local habitats and species. Local livelihoods are based on a history of adaptation and innovation based on local knowledge and belief systems. The diversity of livelihood strategies and resource management practices means that local communities may be affected by development interventions in different ways. A single plantation model may be received in different ways by different communities, causing a range of different adaptation mechanisms.

3. Project success depends upon the communities that will be involved.

A large-scale development project aiming to bring benefits to a foreign investor, the local government and the local people requires a well developed strategy for engaging with local stakeholders. Adequate information and sufficient opportunity for real dialogue among stakeholders will have a direct impact on the social, ecological and economic outcomes of the project. The details of roles and responsibilities of all stakeholders in decision making – including land acquisition, benefit sharing, extension and technical support, monitoring and adjustments to implementation – are of central concern to local stakeholders.

4. Many areas of lower biodiversity value are areas of high livelihood value.

Lower levels of biodiversity may be a reality in landscapes that are intensively managed. But the absolute number of species does not reflect the reliance of local communities on the existing biological diversity. Communities may depend upon a limited number of animal and plant species, but their wellbeing, in terms of health, nutrition and income, may be highly reliant on the accessibility of those species. A plantation model that aims to maintain agrobiodiversity in at least part of its planting cycle should provide at least the same amount of benefits as the existing land use patterns on a similar time-scale.

5. Conversion of a low biodiversity area to plantation land may result in intensified use of high biodiversity areas by communities.

Because landscape components are linked through local livelihoods, changes in one land use type may have implications for other land use types. When access to local resources (including land and products in the fallow cycle) is limited, it is likely that communities will need to rely on resources in other areas. Conversion of large areas of fallow land may mean that local people are forced to expand or intensify their use of other more biologically rich areas. While absolute loss of diversity in areas converted to plantation may be relatively low, there may be a corresponding increase in pressure on other areas of higher biodiversity.

6. Changes in the study site may have larger implications for biodiversity and regional ecosystems.

Large-scale development interventions may have impacts beyond local ecosystems. The plantation area being considered is located in an area of critical importance in the ecosystems of mainland Southeast Asia. The site is a part of the Central Annamites range and the lower Mekong Basin, and is directly adjacent to three Lao National Protected Areas. The areas of intact forest in the study site, together with the aquatic ecosystems that run through it, provide valuable nodes in the natural network that supports the ecological integrity of the regional environment (see figure ES 1).

Recommendations

5.1 Recommendations to strengthen the plantation process

It is recommended that Burapha/Stora Enso:

Process R5.1.1: Better engage provincial and district government officials to inform them about the details of the project and gain their support in linking the project to local development goals.

Process R5.1.2: Review its initial village engagement process to ensure that villagers understand that land has not been predetermined and that the purpose of the meeting is to see if the villagers are interested in the project

Process R5.1.3: Continue to conduct independent, socio-economic baseline surveying to ensure that the variety of issues arising from a potential plantation are presented and options for mitigation and management outlined.

Process R5.1.4: Expand collaborative land use mapping exercises to eventually cover all districts. Strengthen these exercises with simultaneous socio-economic and biodiversity studies.

Process R5.1.5: Strengthen biodiversity considerations in the plantation preparation phase by adopting recognised guidelines, such as Forest Stewardship Council guidelines, for the conservation of biodiversity in plantation projects

Process R5.1.6: Review the timing of the plantation preparation phase to ensure that the plantation and intercropping schedule provides optimal benefit for the plantation as well as for livelihood crops.

Process R5.1.7: Initiate biodiversity monitoring programmes to monitor the progress of the integration of Stora Enso's proposed environmental safeguards into the plantation operation and evaluate benefits to local communities, and resolve issues/conflicts. Ensure that monitoring results feed back into management and other decision-making processes.

5.2 Recommendations to minimize harmful impacts of plantations on biodiversity and related ecosystem services through implementation of appropriate guidelines and monitoring practices

Guidelines 5.2.1: Integrate environmental safeguards suggested in this report into the proposed plantation forestry operation

- Sensitization of forestry workers to adopt environmental safeguards and best practice guidelines in forestry operations provided in this report
- Guidelines for selection of suitable sites for establishment of plantation forest plots:
- Guidelines for land clearing phase
- Guidelines for maintenance of agro-forestry operations
- Off-site biodiversity conservation activities

Monitoring 5.2.2: Implement indicators and tools for monitoring of environmental safeguards and biodiversity in forestry plots

- Establishment of baseline indicators for monitoring, during pre-clearance phase
- Monitoring indicators for land clearing phase
- Monitoring indicators for plantation maintenance phase
- Monitoring indicators for off-site biodiversity conservation initiatives

5.3 Recommendations for further socio-economic analysis

It is recommended that Burapha/Stora Enso:

Social R5.3.1: Commission in-depth anthropological work in a smaller number of villages in order to better understand persistence and change in the livelihoods, cultural life and natural resources management of these local societies. This information can be used to inform better impact mitigation for the plantation project.

Social R5.3.2: Invest in establishing a baseline and monitoring approach that allows disaggregated analysis for different ethnicities and within communities, so that social and economic equity is achieved.

Social R5.3.3: Commission independent studies on food security that go beyond rice availability to look at access to foods that provide necessary components of balanced nutrition.

Social R5.3.4: Commission independent studies on the role of livestock in local livelihoods and how livestock can work within the plantation model

5.4 Recommendations for linking Stora Enso biodiversity management response to other biodiversity programmes in the area

It is recommended that Burapha/Stora Enso:

Management R5.4.1: Conduct further preparatory phase studies related to the bio-physical, socio-economic, ethno-cultural situation before the implementation of any further plantations. This should include:

- Collaborative land use mapping at district level
- Independent land use and land title studies
- A feasibility study should be undertaken to examine the possibilities of forest restoration

Management R5.4.2: Assist in the strengthening of agricultural extension programs for large scale plantations at both district and provincial levels with the aim at improving local livelihood systems together with the provision of support to local human resource development. Necessary actions include:

- Support research and capacity building of province and district agriculture and forestry extension officers to improve local government skills in:
 - promotion of efficient agricultural and livestock management practices,
 - biodiversity assessment, and
 - prediction of ecological impacts of various plantation interventions
- Explore and nurture a *benefit-sharing model for plantation establishment* with villagers which should be conducted to gain full local participation
- Work with and support district agricultural extension services to provide villagers with required technical assistance

Management R5.4.3: Work with individual communities to integrate plantations into village traditional management practices and support biodiversity conservation interventions at the village level. Necessary actions include:

- Promote community mobilization, empowerment and local governance mechanisms to conserve biodiversity for human well-being
- Maintainin structurally diverse ecosystems around plantations
- Develop livelihood alternatives such as NTFP domestication and aquiculture

Management R5.4.4: Support to government-led biodiversity conservation activities that are currently being implemented in the 5 districts of 2 provinces by government, research institutions, international organizations and international NGOs and local civil society organizations. This should include support to:

- National protected area management in Phou Xang He, Dong Phouvieng and Xe Sap
- Protection of the natural pine forest found in village landscapes near Xe Sap NPAs
- Training courses and capacity building activities in cooperation with local environmental protection and forestry authorities
- District biodiversity monitoring
- Awareness raising and education programmes on ecosystem services and human-wellbeing related to biodiversity

Part 1 – A Rapid Participatory Biodiversity Assessment

1.1 Background

IUCN (International Union for Conservation of Nature) in Lao PDR has conducted an independent Rapid and Participatory Biodiversity Assessment (RPBA) in five districts in Savanakheth and Salavan provinces in order to inform a larger environmental and social impact assessment (ESIA) that is being coordinated by Salwood Asia Pacific for a Stora Enso Eucalyptus plantation project.

With the plantation sector in Lao PDR rapidly expanding, this RPBA and the broader Stora Enso ESIA also provide an important opportunity to use multi-stakeholder engagement in order to determine new ways of strengthening governance in the Lao PDR plantation sector and ultimately to determine mechanisms for ensuring that the sector's growth is both equitable and sustainable.

1.1.1 The Stora Enso Plantation Project

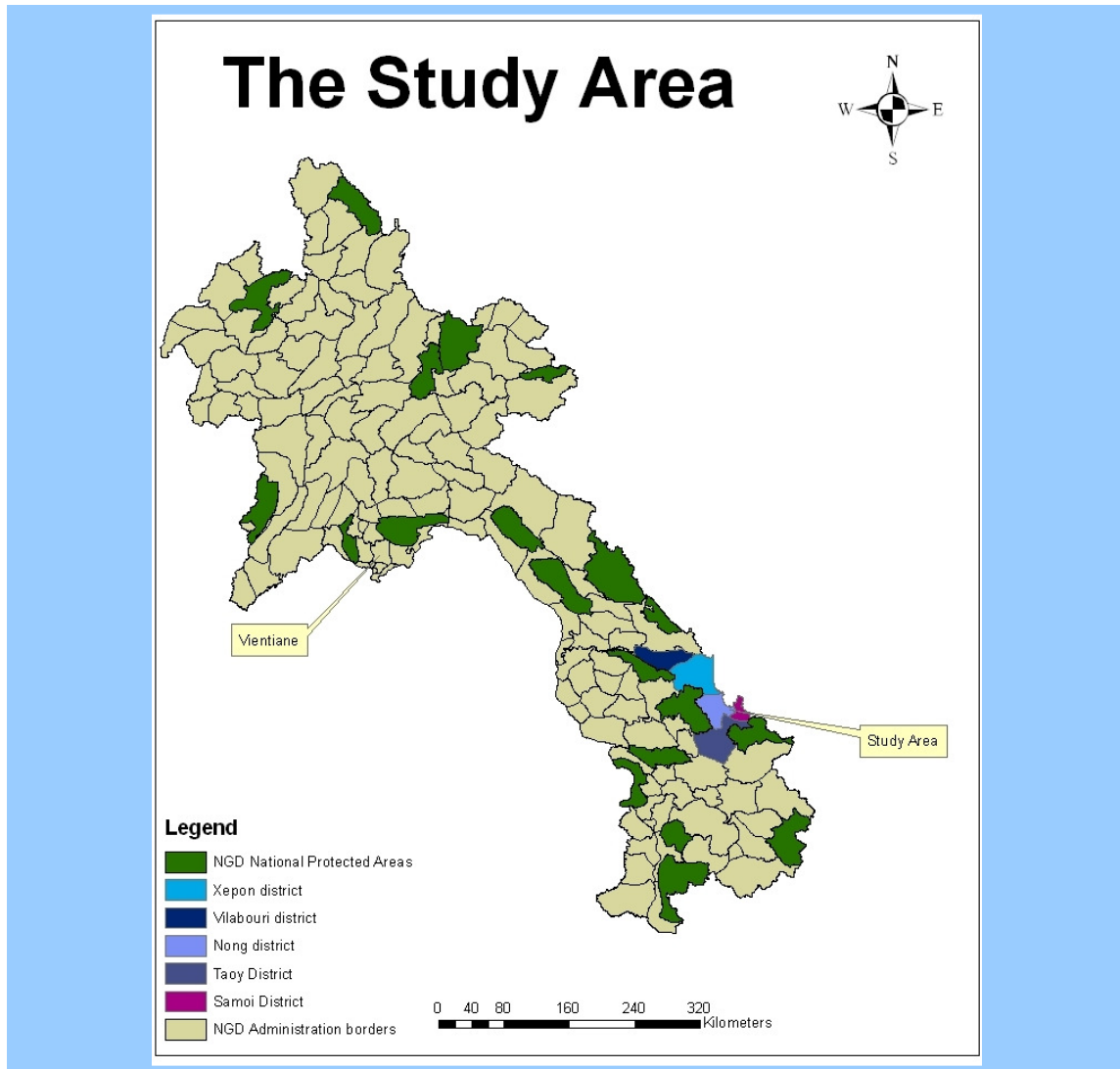
Stora Enso is a large Finnish and Swedish paper, packaging and forest products company. The company is planning to establish 35 000ha of Eucalyptus plantations in Nong, Sepon, Taoy, Vilabouri and Samoi districts, Savannakhet and Salavan provinces, Lao PDR (see project area map figure 1.1). Key project statistics are outlined in table 1.1.

Table 1.1: Key Project Statistics

Total Plantation Area	35,000ha
Annual Plantation Area	5,000ha
Total Investment	USD 40-50 million
Labour opportunity	200,000 man days/year
Labour payments	USD 500,000/year
Employment opportunities	150 - 200 persons
Wood production	700,000 - 1,000,000 ton/year
Rice production (1,000 ha)	1,000 - 1,200 ton/year

Source: Burapha PowerPoint Presentation 2007 'Stora Enso Going Forward in Laos'

Figure 1.1 Biodiversity Study Area
Source: National Geographic Department 2003



1.1.2 The Plantation Model

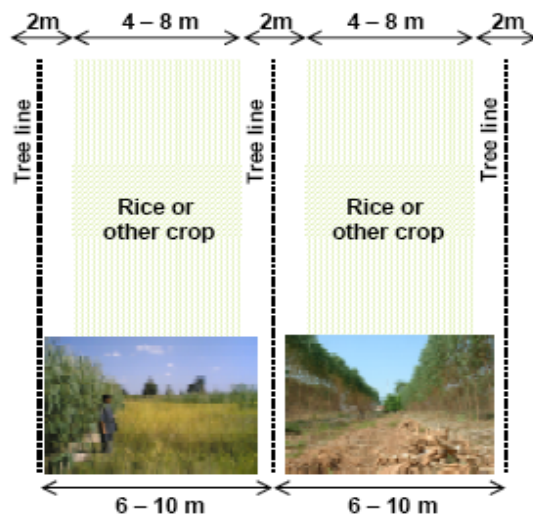
The plantation project will include an agro-forestry model in some areas. In addition to wood production, the agro-forestry model intends to improve the welfare of local communities and increase yields of rice and other food crops. According to the company, the agro-forestry model (see figure 1.2) will allow for up to 70% of the plantation area to be used for community agriculture – agriculture crops owned and managed by local villagers. Eucalypts are planted in rows, six metres apart, and allow for four metre wide agriculture areas where rice or other crops can be planted. These plantations will be spread over approximately 100 sites, with an average of 350ha in size (~150ha minimum and 500ha maximum).

1.1.3 Status of the project

The project is currently in a feasibility phase. Stora Enso has contracted Burapha Agro Forestry Co. Ltd (Burapha), a Lao-Swedish plantation and consultancy company to carry out this feasibility to:

- Initiate contact with communities, and district/provincial/national governments;
- Gather information on the project area; and
- Commence pilot plantations on selected sites (see box 5.1: *Plantation process*).

Figure 1.2 Stora Enso Plantation Model



Source: Stora Enso Project Documents

exercises are also being conducted in cooperation with the National Land Management Authority and district and province agricultural and forestry offices. This information has been sourced (see Annex 1 Secondary Data Sources – Maps).

The company has provided funds to renovate the nursery at the forestry school located in Sepon and has commenced growing seedlings. Plans for a full scale nursery have been developed and a site selected near Ban Along in Nong district. Land clearing and clearance of unexploded ordinance (UXO) commenced in 2006 and trial plantations have been established over the last 12 months in Nong and Taoy districts.

1.1.4 Environmental and social management practices

Stora Enso is committed to follow the best environmental and social management practices in plantation establishment and management. The company has commissioned an independent environmental and social assessment (ESIA) of the area which will be coordinated by Salwood Asia Pacific Pty Ltd., an Australian based consulting firm. The purpose of the ESIA is to identify and assess the environmental and social impacts associated with this project so that Stora Enso may determine and implement the suitable measures for mitigating and monitoring the impacts as early as possible and to identify options for social and environmental investments /development strategy in the areas of its influence.

¹ This consultancy consists of Helena Axelsson and Petter Svensson (Marketing Manager of Burapha Group)

1.1.5 How this biodiversity assessment will inform the overall ESIA

The key purpose of this assessment is to provide independent, credible and sound biological and social information, analyses and recommendations to inform the ESIA and guide subsequent planning, impact management and monitoring decisions. Table 1.2 details how this information will inform the main ESIA.

Table 1.3 Biodiversity assessment inputs into the overall ESIA

Content for the biodiversity assessment	Main input into ESIA (ESIA tasks as defined by the ESIA ToR)
1. Biological and social information	
Background information on location and physical characteristics including main ecosystems, vegetation/land use types and administrative categories of land	Task 1 – biodiversity conservation & livelihoods Task 2 – biodiversity description of the project Task 3 – biodiversity information, its use and management
Utilisation of biodiversity resources including wood and non-wood products, agriculture and traditional management practices	Task 5 – biodiversity and livelihood linkages
Assessment of the state of biodiversity in the project area including ecosystem diversity and species diversity and status	Task 5 – inform social and environmental impact assessment Task 7 – inform development of management plan, mitigation and enhancement of positive impacts Task 9 – inform development of monitoring plan (biodiversity)
Trends in biodiversity in the project area including major threats, resources under sustainable use and conservation needs	Task 5 – inform social and environmental impact assessment Task 7 – inform development of management plan, mitigation and enhancement of positive impacts Task 9 – inform development of monitoring plan (biodiversity)
Management of biodiversity resources including national/sub national policy, institutional and legal framework, local management and biodiversity management programmes	Task 4 – inform legal and regulatory section Task 8 – inform institutional needs analysis Task 7 – inform development of management plan, mitigation and enhancement of positive impacts Task 9 – inform development of monitoring plan (biodiversity)
1. Recommendations and tools for:	
Preventing/mitigating negative impacts on biological resources in the assessment area	Task 7 – inform development of management plan, mitigation and enhancement of positive impacts Task 8 – inform institutional needs analysis
Conservation of biological resources in the assessment area	Task 7 – inform development of management plan, mitigation and enhancement of positive impacts Task 9 – inform development of monitoring plan (biodiversity)
Biodiversity management and monitoring planning for the plantations in the assessment area	Task 7 – inform development of management plan, mitigation and enhancement of positive impacts Task 8 – inform institutional needs analysis Task 9 – inform development of monitoring plan (biodiversity)
Institutional and local capacity building on biodiversity assessment, monitoring and management and handling of biodiversity data	Task 8 – inform institutional needs analysis
Linking Stora Enso biodiversity management response to other biodiversity programmes in the area.	Task 7 – inform development of management plan, mitigation and enhancement of positive impacts

Source: Terms of reference for biodiversity assessment

1.2 Introduction

The Rapid and Participatory Biodiversity Assessment (RPBA) was carried out in the potential Burapha/Stora Enso plantation areas in Salavan and Savanakheth Provinces, Lao PDR. This assessment and the pilot phase of Burapha and Stora Enso's plantation project come at a time when investment in the plantation sector in Lao PDR is increasing significantly. While industrial forestry is

[The RPBA]... is a timely opportunity for this type of multi-stakeholder engagement to explore ways of strengthening governance in the plantation sector and ultimately find equitable and sustainable solutions to the growth of this key sector.

seen as one of the cornerstones of the country's economic development and reduction of poverty, the mechanisms in place to guide these investments are weak and information available to decision makers on land-use options is often poor. The rapid expansion of rubber investments across the country has attracted the attention of national and local decision-makers. Examination of investment trends in the agriculture and forestry sectors has raised concern that some plantation investment is having significant adverse impacts on biodiversity and on ecosystem services. Because ecosystem well-being is linked so intricately to human well-being, this adverse effect has resulted in a lack of contribution of plantations to the alleviation of poverty in local communities. As a result, the Prime Minister has also issued a moratorium on all large land concessions for mining and agriculture until policy and governance structures are strengthened.

In order to understand and address the rapid changes occurring, it is necessary for the government to engage with an increasingly broad set of stakeholders that includes the private sector, decisionmakers at all levels, local communities, international organizations and NGOs. The private sector, particularly foreign investors in natural resource-intensive sectors, drive many of the land use change patterns that are being observed. Decision makers at provincial and district levels also have a strong hand in directing investment trends. The diverse rural communities that are ultimately affected by these decisions are often ill-informed about large-scale commercial operations and in-experienced in participating in decision-making at this scale. This lack of information and experience limits their ability to engage effectively in the decision-making processes. Although some progress has been made in improving the consultation processes for large investments, an operational framework for involving local communities in key areas of decision-making remains to be developed and implemented effectively.

The RPBA aims to address these gaps in social and environmental safeguards by using a multi-stakeholder and participatory process to identify potential environmental and social impacts of the proposed plantation project and to provide recommendations to Burapha and Stora Enso for suitable actions to address these impacts. It is not an ESIA, but will instead act as a stand-alone assessment that takes an in-depth and scientific look at the plantation's potential impacts on biodiversity which may be used to inform the ESIA being conducted by Salwood Asia Pacific Pty Ltd. It will not only focus on the direct impacts of the plantation itself, but on the indirect impacts the plantation might create through altering the way that local people use and interact with their surrounding environment.

Scope of the report: This report details the findings of the RPBA including biological and social information of the study area. The RBTA provides an analysis of the linkages between biodiversity and livelihoods and presents a series of recommendations to inform the ESIA process and guide subsequent impact assessment, management and monitoring decisions.

1.3 A Rapid & Participatory Assessment Methodology

The Rapid Participatory Biodiversity Assessment methodology included one phase of key information gathering for secondary sources on biodiversity and related ecosystem services in the study area. During the second phase, researchers ground-truthed these findings through a series of field missions in selected landscapes surrounding local community settlements in proposed plantation areas. The RPBA methodology's main advantage lies in its straightforward and participatory approach to gathering scientific information on natural resource use by local communities, utilizing the active engagement of local people throughout the process.

The methodology involves a mix of scoping and secondary data gathering and field assessment with the aims of generating information to:

- Understand local habitat/ecosystem classifications and their significance based on local ecological knowledge, and to document the species composition of plants and animals that inhabit them;
- Understand the dependence of local communities on their surrounding landscapes, and to obtain different ecosystem services;
- Identify issues/threats that may have negative impacts on relevant ecosystem services; and
- Conduct a qualitative analysis of ecosystem services related to surrounding landscapes

The following sections provide a brief overview of the RPBA methodology. A more detailed account is outlined in Annex 2.

1.3.1 Scoping and Secondary Data Gathering

RPBAs draw substantially on secondary information. Data gathering during the scoping stages involved initial *scoping interviews* and stakeholder *consultations*.

Secondary information gathered during these two exercises included published and unpublished papers and reports related to the biodiversity and socio-economics of Salavan and Savannakhet provinces (see section 6: References). This information was gathered and analysed for key issue areas and information gaps. This analysis was then used to direct the focus of the field missions. Box 1.4 outlines some of the key concerns raised in consultation meetings with provincial and district officials held on 16-19 October 2007.

Box 1.4 Notes from consultation meetings with Provincial and District Officials

- During the course of the discussions with provincial and district officials, it was clear that many representatives were unaware of the proposed project. Their lack of knowledge about the project amplified concerns about it;
- Government representatives were not convinced of the overall benefits of proposed development activity. Their concerns revolved around possible impacts on livelihoods, loss of access to fallow lands and lack of clarity of actual benefits to the province and its local communities;
- One district representative outlined his concerns that Burapha's initial activities in Taoy included clearing land without surveying what the area was composed of and how local people depend on the natural resources in that area. He stressed that before any further intervention happens, there should be a proper survey of what exists in the area and how the local communities rely on natural resources there;
- Both meetings consisted of lengthy discussions about the Stora Enso model and the IUCN biodiversity assessment. Representatives voiced their satisfaction that the company was

serious enough about addressing social and environmental impacts that they had commissioned an independent study on biodiversity and livelihoods in the study area. One official commented that this was uncommon in his district.

- Nong district officials expressed concerns about the implications of forest plantations in general on food security. The official noted that this issue is important to ensure sufficient food for local people.
- People are concerned about land management and allocation in mountainous areas, mainly the traditional tenure systems which have existed for a long time. These should be recognised by the company as a reality on the ground, and should be addressed as such when considering official compensation policies
- Although the project would provide work for villagers as labourers, some people will not be able to adjust their livelihoods to work for the company in this capacity. The company should work to raise awareness among local communities about this issue so that they understand the trade-offs that would result from project implementation.
- In regard to the impacts of large scale plantation on livelihoods, local authorities requested that short-term alternative strategies be identified to help impacted people to cope with long-term livelihood issues. This could include improving agriculture skills and knowledge about intercropping livelihood crops in tree plantations, or providing access or supporting funds to invest in suitable allocated land in upland areas (with Government permission).
- Provincial and district officials all requested that their offices be kept better informed about the developments of the project. They requested that government officials be invited to take part in the biodiversity assessment in order to get a more in depth understanding of the potential impacts of the project, both positive and negative.

A thorough analysis of this secondary information indicated that while overall there is an ample amount of information available about the two provinces (and the five districts relevant for the proposed assessment) there are number of information gaps, including:

- *Information on recently consolidated or relocated villages* – Some districts such as Sepon have undergone significant village consolidation and relocation and information on this is limited.
- *Gaps in flora and NTFP data* – while there have been some good studies in the north western parts of the study area, very little information on flora species and NTFP use could be sourced for Taoy and Samoi districts.
- *Biodiversity assessments in non protected area landscapes* – Only limited information on biodiversity outside protected areas exists in the study area. The Crome et al (2003) study of the Sepon Mine concession area is one exception. It should however be noted that assessments carried out in protected areas are still representative of a variety of habitats and are inclusive of mosaic village landscapes.
- *Aquatic Biodiversity* – while aquatic biodiversity is vital for food security of people there is a distinct lack of information on this resource and in-depth studies on the water resources in this area. Unfortunately a study 1997 conducted by Maurice Kottelat Fishes of the Nam Theun and Xe Bangfai basins could not be sourced.
- *Official Demographic Information* - Government data on ethnicity is scarce. Beyond basic demographics, indicators of development are infrequently disaggregated to highlight

differences and similarities among groups of varying ethnicity. Agricultural data is thin, especially in Salavan. The inability for this review to source earlier agricultural statistics has prevented trend analysis.

- *Anthropological studies of ethnic groups* - ethnographic research is seriously lacking for the Mon-Khmer groups of the south. Increasingly, aspects of social science are being used to understand the situation of poverty and environment in some projects. A socio-cultural survey of Vilabouri district in Savannakhet carried out by LXML has not been publicly released.
- *Information on Samoi* – in general, information on Samoi District is very limited. Information was hard to obtain even when teams went down to perform field components of this assessment.

1.3.2 Field Assessment and Data Analysis

To ensure a representative and integrated social/biodiversity approach, the field methodology placed an emphasis on fewer but more detailed and in-depth engagements with local villages. A four step information gathering and analysis process was adopted which included:

1. *Village selection* based on representative landscapes, representative ethnicities, Burapha plantation areas of interest and accessibility
2. *Assembly of a multi-disciplinary assessment team* including representatives from provincial and district government
3. *Village consultation* including village focal group meetings, representative landscape transect walks and a village debrief to gain an insight into villagers perceptions of the positive and negative impacts of plantations
4. *Data compilation and analysis* was then conducted using a number of tools including village information sheets; landscapes and livelihood assessments; species list consolidation; mapping and GPS and photos taken of the area.

1.3.3 Final Stakeholder Consultations

A final stakeholder consultation meeting will be held in Savannakhet to share the results of this biodiversity assessment with government and community representatives.

1.3.4 Methodology Limitations

The RPBA methodology allowed assessment teams to cover a large area in a very short time period and to make informed judgements about the use, state, trends and threats to biodiversity in the study area. The RPBA by its very nature does not allow for a comprehensive scientific study of the intricacies of biodiversity and its importance to people in the study area.

In addition to this overarching limitation, the following constraints and limitations that may have impacted data gathering should be noted:

- Weather and road conditions limited district representation at the Salavan stakeholders meeting.
- The Savannakhet stakeholder meeting was held in Sepon to make it most accessible for district officials and local stakeholders. As a result, representation from the provincial level was minimal – especially from the civil society working in the area.
- Information on the assessment area is limited and dispersed across a number of organisations. Remoteness, of the area seems to be a critical factor in the limited information

available especially in hard to reach places such as Samoi where access by road in Lao is limited to the dry season months.

- There were some problems with official communications within the Savannakhet Agriculture and Forestry administrative hierarchy, causing difficulty in making official contact with some villages.
- Recent village consolidations in Sepon district meant that basic demographic and socio-economic data in many villages was incomplete, outdated or completely lacking.
- Language proved difficult in some villages where locals did not speak Lao well. This impacted particularly on the results of species identification – some species were only identified in the local language. For scientific quality reasons, this information could not be used in the final species analysis.
- The rapid nature of the survey meant that women's participation in the focus groups was not as high as hoped, although the team found that transect walks are an excellent way of providing voice to women.
- The villagers tended to withhold information on exploitation of animal species, in the presence of government officials
- Some of the information provided by villagers seemed to be contradictory, and time was a constraint in verifying such information.

Part 2 – Overview of the project area: Location, People and Landscapes

2.1 Location and physical characteristics of the study area

Savannakhet and Salavan provinces are located in Southern Lao PDR. Savannakhet has an area of 21 774km², which is broken into 15 districts and lies between Khammuane and Salavan Provinces. Salavan has an area of 10,691km² which is broken into 8 districts and lies directly south of Savannakhet Province and north of Sekong Province (NSC 2005). The project area's 5 districts, Vilabouri, Sepon, Nong, Taoy and Samoi lie along the eastern boarder of both these provinces and share an international border with Viet Nam – see figure 1.1.

The general terrain of these districts is characterized by undulating agricultural and fallow landscapes interspersed with large pockets of re-growth and remnant forest, surrounded by mountains consisting largely of secondary, evergreen, semi evergreen and montane rainforest (Baltzer et al 2001c; UNDP 1998). These landscapes were heavily impacted by use of defoliant and carpet bombing during the American-Vietnam war (see box 2.2).

Box 2.2 - The impacts of war on people and the landscape.

The study area was a location of strategic interest during the American/Vietnam war. Lying due west of the Viet Nam north-south de-militarized zone, this area was the home to an extensive network of trails and roads known as the Ho Chi Minh trail used by the North Vietnamese Army as a transport route between the north and south of Viet Nam.

Savannakhet was the site of the second biggest conflict in Laos when the US retook the area around Sepon along national route 9 to launch an offensive called Lam Seun 719 which saw over 60 000 South Vietnamese troops supported by US aerial support and 100 000 North Vietnamese troops. The offensive was a failure and following this the US decided to increase aerial offensives and bombing campaigns, 'carpet bombing' and using an array of defoliant, most heavily on the districts lying along the Viet Nam-Lao boarder. Between 1965 and 1973, 1.1 million tonnes of bombs were dropped on the trail, 1,600,000 litres of herbicide, 338,237 of Napalm and between 2,000,000 and 4,000,000 tonnes of ammunition were used in this area during the war, of which 40% remain unexploded (nation wide) (Daviau 2004). As a result UXOs are a major issue in the study area and casualties are still extremely common.

Savannakhet Province has two main geographical areas: lowlands to the west account for 58% and highlands to the east represent the remaining land area. The average height of the province is 100 metres above sea level. Eastern highlands rise to 1300m.

Salavan Province can be divided into three geographical areas:

- The plains region in Salavan, Toumlan Khongxedon, Vapi and Nakhonepheng districts, covering 40% of the province and rich fertile land used for agriculture;
- The plateau region, covering 20% and lying in the district of Laongam bordering Champassak province used for agriculture and forestry; and
- The mountainous region of Taoy and Samoi districts in the east, covering the remaining 40% of the province and considered "ideal for short-term and mid-term industrial forestry" (DAF 2005)

The study area lies in the Southeast Asia monsoon tropical climate, dominated by the northeast and then southwest monsoons that produce three distinct seasons. The cool dry season influenced by the

cold continental high pressure region over China lasts from November through to February when winds spiral clockwise down from China into Southeast Asia. This is the northeast monsoon, bringing with it, cold dry air with infrequent light rainfall. Between March and April the area starts to heat up and between April and October the southwest monsoons – consisting of warm winds and humid conditions – bring seasonal rain. Annual rainfall in Savannakhet is 1400 to 1700mm and 90% of this occurs between May and September. Maximum daily temperatures in the area range between 14°C and 35°C. The average temperature of Savannakhet is 26°C (IUCN/DoF 2000; Daviau 2004; Hallam et al. 2006).

The Annamite mountain ridge, a key feature of the study area, holds the north easterly monsoons over the mountains (Baltzer et al 2001a). Other mountains in the study area including the protected areas of Phou Xang He, Dong Phouvieng and Xe Sap; All attract significant rainfall and act as important watersheds for lower lying landscapes.

According to discussions with some stakeholders, weather conditions in Samoi district can be quite different to weather conditions in the rest of the study area. Cool and wet conditions were reported to occur at different times of the year and for shorter periods than in other areas. However no published information could be sourced to verify these statements.

2.2 People in the study area

2.2.1 Basic demographics

The study area is populated by a number of ethnic groups, from the Lao-Tai and Mon-Khmer linguistic groups. At the broadest level, Lao-Tai (Lao and Phou Thay) inhabit the valley areas, while the Mon-Khmer (Brou and Taoy) live in the foothills and mountainous areas. This simplistic typology is reflected in the outdated and now officially abandoned system of referring to ethnic groups according to the Lao Lum, Lao Theung and Lao Sung classification which distinguishes ethnic groups by the general elevation at which they live. Two important factors of reality are that 1) within these distinctions there is significant linguistic and diversity within these groups and 2) the history of upheaval from the war years followed by the subsequent policies of stabilizing shifting cultivation and consolidating villages has meant that ethnic groups live in a number of topographic and ecological zones.

In general, statistical data on basic socio-economic development indicators disaggregated by ethnic groups is scarce. The following table (2.1) shows literacy rates for the Mon-Khmer groups in Salavanh province.

Table 2.3 Literacy rates of Mon-Khmer ethnic groups

Mon-Khmer groups	Total (%)	Women (%)
Katang	34.7	16.3
Ta-oy	49.0	19.8
Yru	37.5	35.7
Suai	47.9	32.8
Pacoh	24.4	7.7
Kriang	44.9	25.9

2.2.2 Ethnic groups and poverty

Ethnicity is an essential component in the analysis of poverty in Lao. The latest Participatory Poverty Assessment (PPA 2007) states that:

Diversity of languages and cultures is one of the main characteristics of Lao and potentially one of its greatest strengths. Unfortunately this diversity is often viewed as a hindrance rather than an asset. This is no doubt related to the fact that responses to development and modernization vary considerable between ethnic groups and that certain groups are more negatively impacted than others in the face of changes that occur (p.10).

Nationally, there are significant gaps in the poverty rates across ethnic groups. Among the Lao-Tai groups the poverty rate is 20%, while 54% of Mon-Khmer groups are classified as poor. Salavanh and Savannakhet provinces are populated by a large number of Lao-Tai and Mon-Khmer groups. The PPA 2007 found that, although there was significant progress made in terms of some quantitative indicators of poverty, the majority of villages studied had approximately the same or worse living conditions.

The two primary causes of poverty identified by villagers across the country are 1) limited access to land for cultivation and 2) livestock disease. The PPA 2006 found that poverty in the southern region of the country has remained stagnant between the period of 2000-2005. The main causes of poverty remain unchanged, and were identified and ranked by villagers according to frequency of occurrence:

1. Lack of land for cultivation
2. Natural disasters that affect rice yields
3. Not enough livestock
4. Lack of investment money, relocation
5. Do not know what to do, have no cash crops, lack access to market, lack of water for cultivation or for opening new paddies
6. Do not know techniques of paddy cultivation, lack of education, land taken by Vietnamese plantation enterprise with no compensation, no electricity, still poor from the effects of the war, village consolidation leading to overpopulation

Comparing the data presented in the 2000 and 2006 PPAs shows some worrying trends in general socio-economic wellbeing in the southern region. For example, consumption of meat and vegetables from wild sources decreased 30% and 15% respectively. Similarly, livestock holding in poor villages were found to have increased in only 10 percent of villages, while there were decreases in 70%. Educational performance shows no significant change. Health and sanitation remains problematic. In the south, villagers often prefer to drink unboiled water from streams and wells. Mosquito nets remain largely unused, and village medical kits have not been utilized. In general, government services – education, health and agricultural extension – were seen to be insufficient, not providing relevant support to the issue of poverty reduction.

In Mon-Khmer communities in the south, decreased access to land has had negative impacts on key poverty indicators. Fully 66% of villages experienced a reduction in swidden land per household in the period of 2000-2006. Mon-Khmer livelihoods are intimately intertwined with their swidden land management systems, and loss of access to swidden land frequently correlates with negative trends in food security. For example, according to the PPAs, as swidden land per household was reduced between 2000 and 2006, consumption of wild meat declined by 35% and consumption of wild vegetables decreased by 8%.

Livestock are a critical component of rural livelihoods. Nationally, the number of large bovines being kept by villagers has decreased markedly. In the south, 70% of households experienced decreases. Access to veterinary services is given as a reason for this decline.

Solutions to poverty identified by villagers reflected direct responses to these issues of access to land and livestock. The results suggest that villagers believe the problem to be out of their hands, requiring assistance from the government in terms of financial and physical inputs. Interestingly, the study suggests that villager solutions to poverty tell us “what people will do, as opposed to what they could do to alleviate poverty” (p. 47). In the south, solutions to poverty included:

1. Open more paddy land, or increase land in general; raise or increase large bovines, raise livestock in general
2. Irrigation, weirs, water for cultivation and animals
3. Don't have any solutions, whatever the government wants; grow corn and/or cassava; plant commercial trees
4. Borrow money for small scale investments, grow vegetables for market, fruit trees, grow coffee to sell by the roadside
5. Grow rubber, relocate to a new location where land is available

The PPA 2007's conclusion that "Mon-Khmer groups are especially vulnerable when swidden practices are changed or abandoned", suggests that any development intervention that has potential for significant impact on swidden land use systems should be examined with great detail.

Despite the relatively thin understanding of the ethnic minorities in the area, there have been some initial advances in bringing an anthropological perspective into development. The social and anthropological studies included in the literature review conclude that a deeper understanding of local practices, knowledge and beliefs, both traditional and evolving, should inform decision making about development interventions.

Chamberlain (pers. comm.) has mentioned that the Phou Thay and Brou of Vilabouli district in Savannakhet have not been subjected to the full range of coercion in application of state policies. They have been able to be more selective in what aspects of mainstream Lao development they want to adopt, based on the utility of development 'benefits' to their own lifestyles and livelihoods. However, because of their linguistic and cultural affinity to the ethnic Lao, the Phou Thay may receive more of the benefits of education, compared to the Brou.

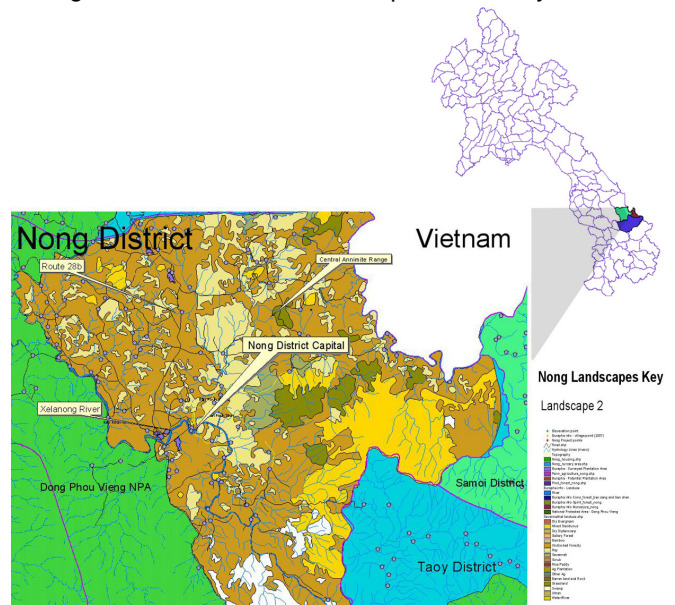
2.3. Representative landscapes

Sitting at the centre of the important natural ecosystems of the Central Annamites and the three National Protected Areas of Phou Xang He, Dong Phouvieng and Xe Sap is a mosaic of dynamic landscapes consisting of settlements, agricultural land, regenerated or fallow forest, and remnant forest ranging from high altitude mountainous areas to riverine valleys. To cover this large project area, this RPBA adopted a representative landscapes approach, capturing the connectivity between the diverse natural and social systems. The sections below give an overview of landscapes visited by the assessment teams. A field example has been provided for each district. These examples outline the main observations made by assessment teams across the study area.

2.3.1. Nong District - Representative landscapes

Nong district is mainly mountainous in the north and east, with flatland and river valleys to the south. To the east of Nong lies the Central Annamite Ridge. A large section (the 1998 extension) of the National Protected Area Dong Phouvieng provides a natural boarder with Phin district, running from north to south. The major rivers in Nong district are the Xelanong and Sepon. Representative landscapes visited during the assessment include:

- **Riverine flatland and foothills (Ban Kounsi, Loe and Along)** – This landscape type consists of flat lowland landscape on the banks of the



Xelanong River with undulating hills, rising to mountains with abundant primary and regenerated forest. Dong Phouvieng National Protected Area is situated on the west bank of the Xelanong River. Village residential areas are surrounded by a mixture of un-stocked and stocked forests serving as burial, spirit and village use forests. There are upland grassland areas outside Ban Along – these areas supply grass for the construction of house roofs. Rotational swidden agriculture is carried out in young fallow areas nearby the village settlement. Stora Enso feasibility studies and trial plantations have commenced in the area, focusing on areas classified by the National Geographic Department in their 2003 land-use data as un-stocked forest.

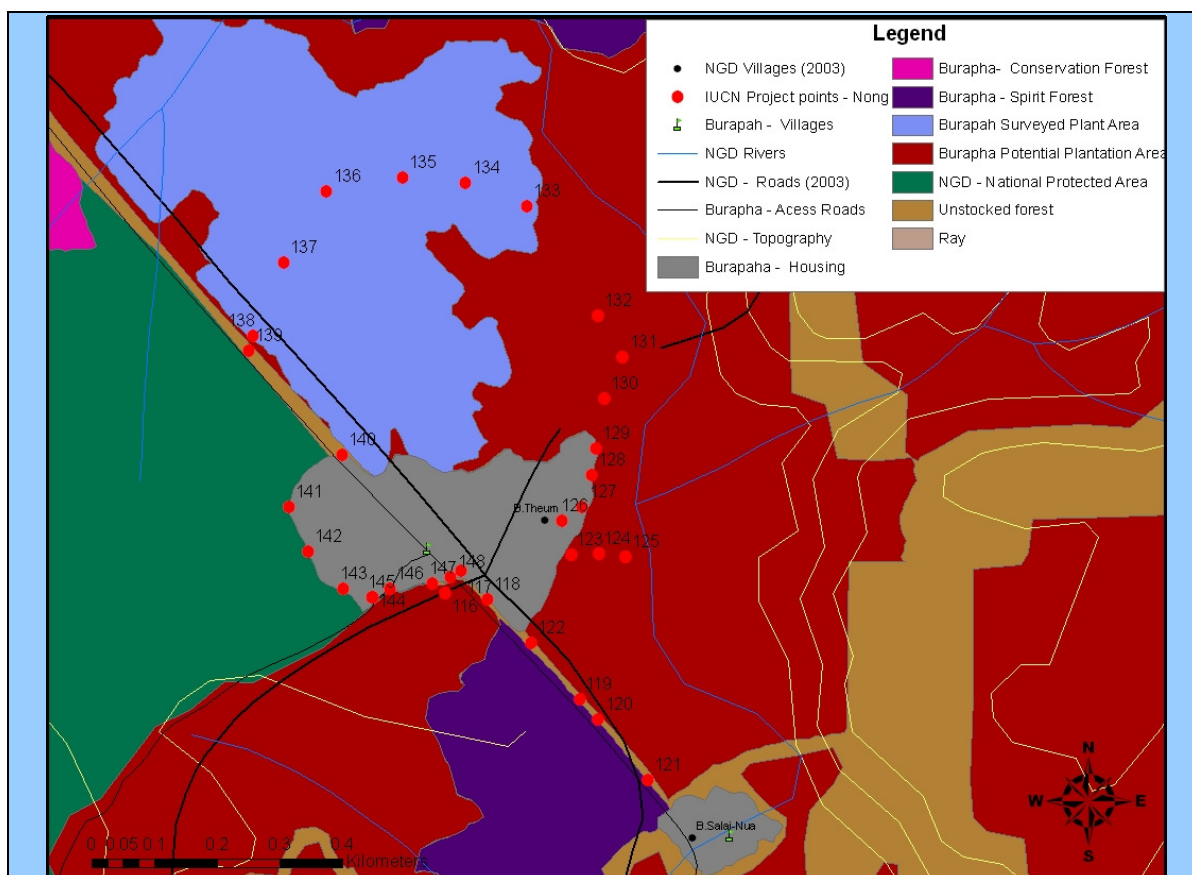
- **Riverine flatland and foothills (Ban Phoun Nhang and Phoun Tong)** – This area is characterized by flat lowland agricultural land and fallow forest on the banks of the Xelou River with undulating hills rising to mountains approximately 7-10km away, consisting of primary and regenerated forest. There is limited remnant forest in immediate village proximity, mainly old fallow protected as village spirit of burial forest. Swidden agriculture is carried out in areas nearby the village settlement. Although this area seems to present a good opportunity for plantations, according to the information received from Stora Enso and discussions with the communities, the company has not conducted any feasibility studies in the area.
- **Upland with stream (Ban Houb, Tamluang and Sang-Chene)** – The area is mainly elevated flat village landscape with small streams surrounded by undulating hills and mountainous areas consisting of well stocked forests. Dong Phouvieng NPA lies immediately west of Ban Sang Chene. Village residential area surrounded by a mixture of un-stocked and stocked forests serving as burial, spirit and village use forests. Swidden agriculture is carried out in areas nearby the village settlement. There are upland grassland areas outside Ban Sang Chene. Stora Enso feasibility studies and trial plantations have commenced in the area.

Box 2.4 Nong Field Example: Sang-Chean

Ban Sang-Chean

Ban Sang-Chean is located in the northern part of Nong district of Savannakhet Province near the main road from Ban Dong, Sepon district, to Ban Nong. In 2004 Ban Sang and Ban Chean were consolidated into one village called “Sang-Chene village”. The village settlement lies on flat lowland and is surrounded by undulating hills. These hilly landscapes consist of abundant primary and regenerated forests. To the west lies Phou Nang Mane, a hilly forest and buffer zone of Dong Phouvieng National Protected Area (see map – area marked in green). The main water resources in the village are the Houay Kathi, Houay Chene and Houay Sabo. Houay Kathi flows around the whole village settlement but this stream is dry during the dry season.

The village is the site of a Stora Enso trial plantation (see map - area marked in light blue area) and has been surveyed for the potential of a much larger plantation (see map - area marked in red). It provides a good example of the potential direct and indirect impacts of plantations in village landscapes across the study area.



Limited land availability in village landscapes: The potential of plantations to have indirect negative impacts on areas of high conservation and livelihood value

The map above highlights the importance of understanding how plantations may increase pressures on other land areas within the overall landscape. In this case, Ban Sang-Chean’s landscape is already experiencing pressure to supply land for:

1. Swidden agriculture production land, including fruit tree and tree plantation land;
2. Livestock grazing;
3. Village protected forest including forest land for village use, forest land protected for spiritual purposes (spirit forest) and forest land protected for human burial (burial forest);
4. National Protected Areas; and
5. Plantation

The assessment team observed the following land-use issues which should be better understood and considered by Burapha/Stora Enso in the future:

- This village faces severe rice shortages as a result of low swidden agriculture production. Low production is mainly due to poor soil fertility and weeds issues (eg imperata grass) which is due to shortening of the fallow period from 7 years into 4 or 5 years and in turn a more degraded landscape. As a result villagers had already cleared large areas of forests for upland rice field expansion – some potentially encroaching into the buffer zone of the national protected area. This means that agricultural land has become scarce in the area, and thus land identification for plantation needs to be carefully assessed and prioritized.
- The current plantation has had an impact on land availability for grazing domestic animals. Animals usually graze on degraded grassland/ swidden hilly areas – which are being considered

as potential plantation areas. Villages have reported that the Burapha trial plantation has constrained grazing activity and they are trying to find alternative areas for grazing.

- Sang-Chean's production/ utilization forest is located at the south of the village consisting of relatively good forest. The village relies heavily on the village utilisation forest for NTFP collection and domestic wood use from Phou Nang Mane on the south and Phou Sang on the north of the village, such as grass for making roof sheets, bamboo shoots for drying, rattan canes and shoots and others. There is a fear that this land may be over-utilized if other land use areas are converted to plantation and no longer provide for livelihoods in the future.

If the large potential plantation identified by Burapha for this area does go forward, these competing land use and livelihood issues are expected to intensify.

Building awareness and monitoring the impacts of the plantation model

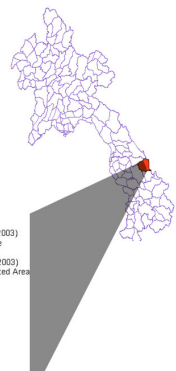
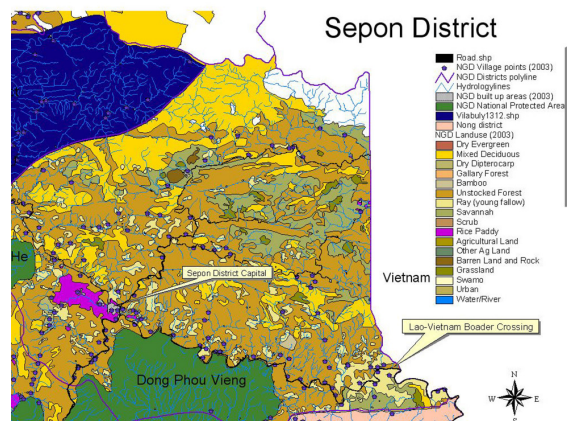
In light of the above issues it is vital that the company and villages ensure that any plantations in the village landscape aid in food security and do not indirectly impact on other high biodiversity landscapes. Recognition of these competing land use issues and awareness of how the plantation model can be implemented to address these concerns is vital. During its visit to Ban Sang Chean, the assessment team found that villages were unaware of the plantation model and had misunderstandings about their right to use the plantation areas for agricultural purposes. It is clear that better relationships between the company and villagers need to be established so that the plantation model can be implemented effectively. Monitoring of how the model is meeting its goals is also important.

Direct impacts of the plantation on areas of high conservation value.

This village settlement is located at the edge of the boundary of Dong Phouvieng National Protected Area (NPA). Plantations to the west of Ban Sang-Chean may encroach on this important area and have a direct impact on the village landscapes. The company must be careful to get clear information on the geography of the area – during the site visit staff from the Department of Forestry arrived to inform the villages of the true boundaries of the protected area and to warn them about the potential for encroachment. Although satellite mapping and ground truthing may reveal heavily degraded areas throughout the landscape, any area that is classified as part of the NPA should not be used for plantation area. The company has an opportunity to support the regeneration of degraded areas of the NPA as part of its commitment to biodiversity conservation.

2.3.2 Sepon District - Representative landscapes

Sepon's landscape is characterised by mountainous areas, steep rolling hills and pockets of flat low lying land along the main rivers and their tributary streams. In the east of the district lies the Central Annamite Ridge, in the south and southwest is the Dong Phouvieng National Protected Area (NPA), which is adjacent to the Phu Nang Maan Provincial Protected Area (PPA). Two main rivers cross through the district; the Sepon river, coming from the south east, forms the border between Vietnam and Nong districts and the Xe Bang Hiang, flowing down through Dong Phouvieng is a direct tributary of the Mekong. Other rivers include the Xe Samou and Se Namkok. Representative landscapes visited during



the assessment include:

- **Riverine flatland and foothills (Ban Houi Jaeng, Muang Janh, Muang Saen and Sepon Kao)** – A flat lowland landscape on the banks of the Sepon River is the main topographic feature of this area. This landscape is mostly flat, extending to the foothills, with villages located around Road 9. Many villages are located between the Sepon River and road. The Phou Naang Maan provincial protected area is the only place where large trees and dense forest can be found. All villages along the road have similar geography: 1) swidden and fallow forest are located mainly above the road, 2) the village settlement and some swidden/fallow mosaics between the road and river, 3) paddy and swidden/fallow at foothills, 4) old fallow running into Phou Nang Maan.
- **Riverine upland forested (Ban Hoai Phong and Khae Ving)** – This landscape is characterized by forested mountains with slope varying from gentle to steep. The banks of the Xe Bang Hiang River are rather steep, the riverbed cut deep into the valley. Villages are located along mountain streams, and surrounded by a mosaic of agricultural land and fallow forest, interspersed with old forest tracts of significant size and biodiversity. Mountain forests are larger and denser than in the lower areas.

Box 2.5: Sepon Field Example - Ban Muang Janh

Ban Muang Janh

The village consists of five village clusters (*koum ban*), with 147 households in total. The *koum ban* (Ban Muang Jvanh, Ban Na Lom, Ban Kaeng Jong, Ban Kaluk Nawk, Ban Huai La'a) were consolidated administratively to function as five distinct villages in June 2006. The main *koum ban* of Ban Muang Janh is of Phou Thai ethnicity; the newly relocated *koum ban* are a mix of Phou Thai, Tri and Makong ethnicities. The village leadership said they are not sure if *koum ban* are going to be relocated or not, now that they have been administratively consolidated. Village upland fields are located in the area north of Rt 9, in the foothills leading up to the higher elevations where denser forest is found.

Biodiversity and livestock in the forest mosaic

According to local knowledge, the village forest has been degraded significantly. During the war, large expanses of forest were destroyed or significantly transformed, and the subsequent removal of hardwoods meant that 1) the village forestlands are now predominantly old fallow regrowth and 2) there are no valuable trees left. Fallow forest now dominates the landscape, and is an important part of the livelihood system as it supplies many products that are consumed locally, or sold in the local markets or to middlemen.

In the transect walk, we passed through dense bamboo forests, open bamboo forests, current upland swiddens, 2-3 yr fallow, 3-4 fallow, mid-length fallow. This detail is lost in the maps. The sound of livestock bells was present throughout the walk, as the villagers graze their cattle in the fallow fields and regrowth forest. We saw several markers in the bamboo forest laying claim to next year's swidden land.



Livestock grazing in fallow field

Conflict with livestock

The fallow forest in the general vicinity of the plantation pilot site located at waypoint 12 is currently used as grazing land for the villagers' cattle. After seedlings were planted for the plantation pilot, they were trampled by the livestock. According to villagers, this caused some tension between the village and the company. Burapha requested that the villagers build a fence, but villagers responded that they didn't have the resources to do that on their own. The village leadership has made an announcement urging villagers to watch their cattle.

Village governance and decision-making

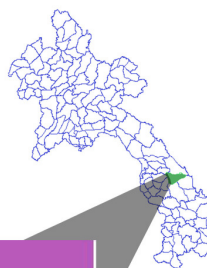
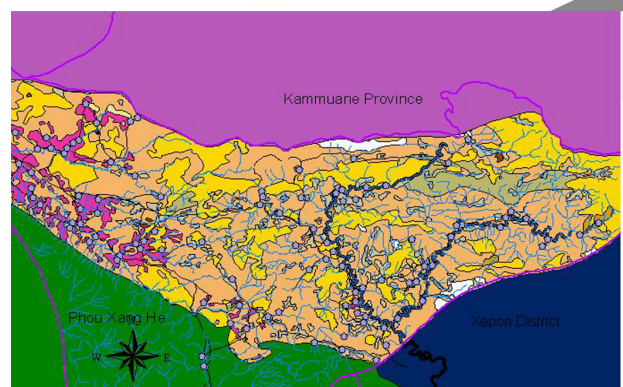
Data on demographics, land use and household/village economy has yet to be compiled by the leadership of the newly consolidated village. Villagers say that the government has done some surveying, but the data has not yet been fed back to the village administration. The villagers recount that Burapha originally asked for 200 ha of land. Villagers were concerned about availability of land for livestock grazing. District officials were alarmed as well, and 14 ha was finally agreed upon. Elders Union (*Neo Hom*) members stated that they were not happy with the 14 ha concession and that they did not agree with any further granting of concessions. Villagers are reportedly not very interested in the daily wage that has been offered. Elders say that the project has not been introduced well to the community, so suspicion is high.

2.3.3 Vilabouri District - Representative landscapes

Vilabouri's landscape is characterised by isolated mountainous areas in the east the Central Annamite ridge and in the west the National Protected Area, Phou Xang He. Major rivers in the district include the Xe Bangfai, Xe Noy and Xe Pone. The district has little cultivated farmland the priority zone lying in the north-west of the district near Nanioum where a large plain and abundant rice fields exist. Representative landscapes visited during the assessment include:

Vilabouri District

- | | |
|--------------------------------|--------------------|
| ● NGD Village points (2003) | NGD Landuse (2003) |
| — NGD Administration borders | Dry Evergreen |
| — NGD Hydrologyline | Mixed Deciduous |
| — NGD Road (2003) | Bamboo |
| — NGD Main road | Unstocked Forest |
| ■ NGD National Protected Areas | Ray (young fallow) |
| ■ Khammuane Province | Savannah |
| ■ Atsphang District | Scrub |
| ■ Phine District | Rice Paddy |
| ■ Astaphone District | Other Ag land |
| ■ Sepone 1305.shp | Barren and Rock |
| | Water/River |



- **Vilabouri plains (Ban Pha Phak Naou, Sa Loh and Nanamsang)**– These flat plains consist mostly of paddy fields and secondary re-growth and scattered patches of grazing land. The area is situated close to Phou Xang He National Protected Area and the Xe Bai River. Village residential areas are surrounded by a mixture of un-stocked and stocked forests serving as burial, spirit and village use forests. Paddy fields dominate the landscape.
- **Riverine rolling terrain, forested (Ban Angkham and Vang Mahang)** – In this area there is undulating hilly and steep terrain of secondary (old fallow) forest (of about 30-50 years). The main water resource of the village is the Xe Sa Gni. Village residential area surrounded by a mixture of un-stocked and stocked forests serving as burial, spirit and village use forests.
- **Riverine rolling terrain, agricultural (Ban Kok Mak)** - Ban Kok Mak is surrounded by young fallow on undulating hills, which is the dominant landscape. The Sai Nam Kheang flows through the village. There are patches of dry dipterocarp forest, evergreen forest. Overall the ecosystem is mostly of human modified and disturbed nature of agricultural based ecosystem. There is very little paddy land and swidden cultivation is practiced.
- **Rolling terrain small streams, forested (Ban Sopa)** – This area is characterised by lowland flat to undulating hilly landscape of secondary forest (of about 30-50 years). With a number of small streams including the Xe Kok. Village residential areas surrounded by a mixture of un-stocked and stocked forests serving as burial, spirit and village use forests.

Box 2.6: Vilabouri Field Example – Ban Na Namsang

Ban Na Namsang

Ban Na Namsang is located to the west of the Vilabouri district centre in Savannakhet Province. The village contains 80 households, all of Phou Thai ethnic group. It is surrounded by paddy fields and old fallow (secondary re-growth) and scattered patches of grazing land as the dominant landscapes. At the far western boundary lies the Phou Xang He National Protected Area (NPA), a major distinctive mountain range landmark contrasting with the Vilabouri lowland plains. Main drainages in the village are the Houay Na Namsang, Houay Khe and Houay Xou.

Land-use competition in the area

Na Namsang's patterns of resource utilisation are a microcosm of the many competitive land-uses in the area. Existing land-uses could potentially be a constraint to land availability for plantation establishment. Currently there are three primary types of land uses which constitute the main study findings irrespective of biodiversity value in the area:

- Paddy and other agriculture production land;
- Livestock grazing land; and
- Village utilization forestland



Small road with village use forest on left hand side

Plantation development is dependent upon the district development program in terms of whether the area can be considered priority for plantation as well as whether appropriate land areas can be made available. The biodiversity survey team's initial observation, however, is that the village land availability may be a limiting factor as much of the land is already being used for paddy cultivation and grazing. Unoccupied area mainly consists of old fallow and good secondary forest and is of high biodiversity value in the mosaic agricultural landscape.

Community concerns about the plantation model

The village authority reported that a number village households have already undertaken industrial plantation, primarily of *Mai ketsana* wood (*Aquilaria crassna*), but it is relatively small-scale. Despite this experience with plantations, when the Stora Enso plantation model was explained briefly locals viewed it sceptically and showed a general lack of enthusiasm for the idea. It was clear that this village and others like it will need a proper introduction to the model and that the company will have to work hard to show that the potential benefits of this model and its desired net livelihood benefits can be realised.



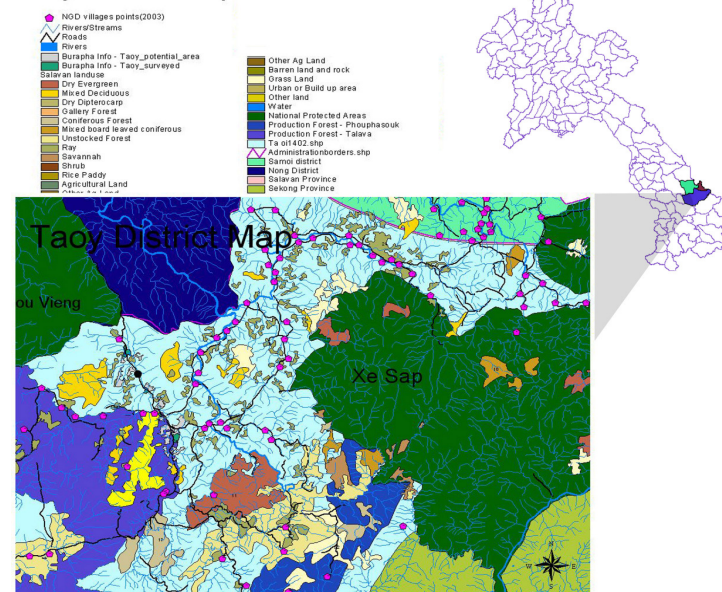
Village Kapok (*Bombax ceiba*) plantations

2.3.4 Taoy District - Representative landscapes

The district is mountainous with an average height of 500 metres above sea level and peaks rising to between 1000 – 2000 metres. A complex network of rivers and streams cut through the landscape. Land is predominately sloping with only 30% flatland on these river banks and on a small amount of highland. Over half of the district is covered in forest and while it is estimated that up to 100 000 ha of mainly flatland in Taoy is suitable for agriculture, cultivation is nonetheless still extremely low. Old growth forest accounts for 20% of the district, mostly found in the national protected area known as Xe Sap on the Taoy – Samoi boarder (Anonymous 2000). Representative landscapes visited during the assessment include:

- Upland with stream (Ban Jorla Vieng and Ten)** – These areas have valleys surrounded by rolling hills and mountains. There are caves in the area and mountain tops covered with primary forest. Small streams run through the village landscape. Village residential areas are surrounded by un-stocked forests serving as burial, spirit and village use forests, and there are large areas of lowland valley rice fields. Swidden agriculture is practiced on nearby hills. Burapha feasibility studies and trial plantations have commenced in the area
- Upland with stream close to primary forest (Ban Douk, Kang, Lapeung and Xeusunthaamong)** – The rolling terrain rises to mountainous areas consisting of primary and secondary forests which near Ban Kang, Xeusunthamong and Lapeung (Talava Production forest) are severely degraded due to intense commercial logging activities. To the south of Ban Douk lies Xe Sap NPA which has more intact primary forest. Small streams run through the village landscapes. Village residential areas are surrounded by un-stocked forests serving as burial, spirit and village use forests. Swidden agriculture is carried out in areas nearby the village settlement. Paddy fields are also common. Burapha feasibility studies and trial plantations have commenced in the area with the exception of areas surrounding Ban Douk.
- Riverine flatland and foothills -**
 Riverine flatland and foothill areas were not visited by the study team. Little information on these areas could be sourced from secondary documents.
- Elevated landscape (high altitude) -**
 Due to time and access limitations, areas of high altitude were not visited by the assessment team. These areas have been covered by previous biodiversity assessments conducted in Xe Xap (see 2.3.5) and to a lesser extent, Talava Production Forest.

Taoy District Map



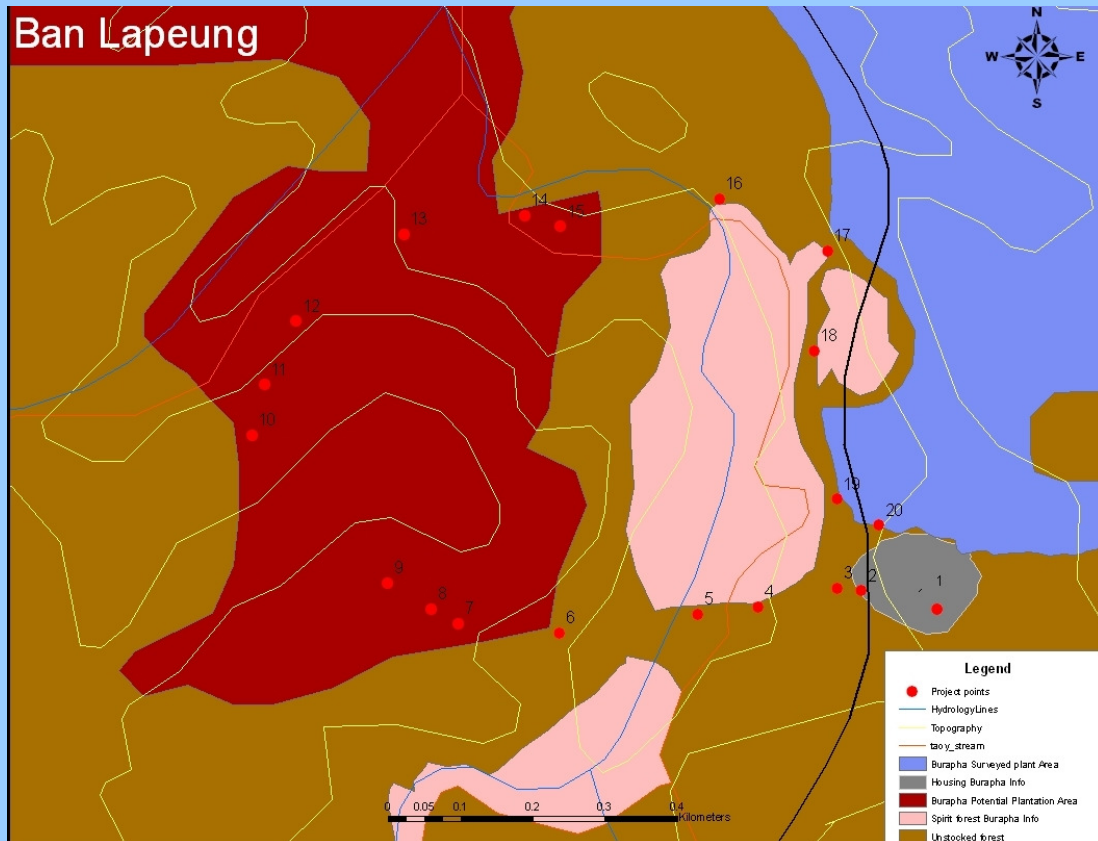
Box 2.7: Taoy Field Example: Ban Lapeung

Ban Lapeung

Ban Lapeung is situated on low rising land, amongst a mountainous landscape. To the north are the Balai Mountains and to the North West is 83ha of land dedicated to Stora Enso for Eucalyptus plantations. To the south are the production forests of the Aleng mountains, and to the south west,

the La Leng mountains. The Lahi River runs along the western, southern and eastern boundaries of the village and is intercepted by the Paid River.

The 'potential plantation area' (shown on this map in red) was observed to hold important fallow and low land rice cultivation areas utilized by Ban Lapeung.



Lowland rice cultivation

Currently the villagers of Ban Lapeung suffer severe rice shortages. Some villagers have only enough rice for 3 months of the year. Insufficient yields of low land rice are largely due to pest invasions, including ants, wild boar, birds, and a debilitating fungi known as *pia*. Weather conditions such as heavy wind have also contributed to poor yields.



Waypoint 13: Ban Lapeung, low land paddy field

Further encroachment into village low land rice cultivation areas will reduce the already insufficient low land rice in the area and potentially further exacerbate the already dire shortage of rice for the villagers. Careful consideration needs to be made in regards to developing any plantation area while still ensuring access to sufficient low land rice cultivation areas. The village does acknowledge that poor low land rice yields could also be attributed to poor genetic variety and the village would welcome assistance in trialing different varieties of low land rice. Assistance to the village in improving low land rice yields is a potential area that Burapha should consider for contributing to the village. Any plantation in an area currently used for the growth of low land rice should be developed in a way that also provides villagers access to other appropriate low land rice cultivation areas that have the potential to provide appropriate yields.

Fallow landscapes and NTFPs

The proposed plantation site includes fallow land, mainly young fallow. While some of this land may be suitable for the proposed plantation, this area is also utilised both growth of upland rice and collection of non-timber forest products (NTFPs). NTFPs from this area are collected to be sold, consumed, used as medicine or used in construction. In times of rice shortages the village relies particularly heavily on NTFPs, including raisens, rattan shoots and bamboo shoots, as alternative food sources to rice. Houses in the village are still made from plant matter including bamboo and grass thatched roofs. Many of these plant species used for consumption and in construction are collected from fallow land.

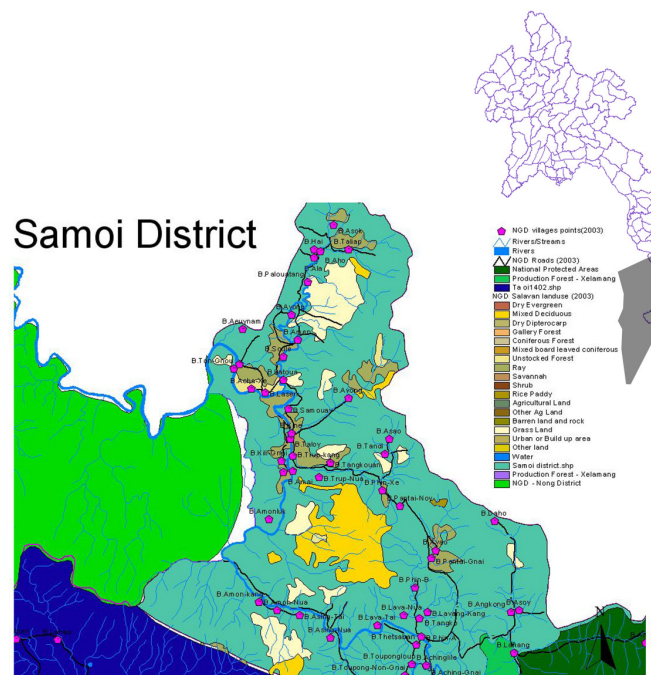
The Lahi river

The proposed plantation area is situated alongside the Lahi river. This river flows along the western, southern and eastern edges of the village and is intercepted by the Paid River. River banks are utilised for the growing of village gardens. The Lahi River is used as a source of drinking water and for general bathing and washing duties. Fishing traps were observed in the area although villagers reported catching primarily prawns because there are little fish or crabs left. They suggested that the decline may be due to poor water quality. This river also plays an important role in the small scale generation of hydro electricity. Any plantation or access routes to the plantation should be developed in ways that ensure that the river system is not disrupted so that they do not impact upon these vital services that the river provides to the village.

2.3.5 Samoi District - Representative landscapes

The district landscape is mainly mountainous and is dominated by 44 971ha of forest and 12 029ha of productive land (DPIb 2007b). The Sepon River flows from the north of the district to the south and is fed by a large number of tributaries. There are 3 distinct landscape classifications: 1) riverside landscape consisting on flat banks and rolling hills; 2) elevated areas with many streams and 3) high altitude areas. Representative landscapes visited during the assessment include:

- **Upland with stream (Ban Lalai Akong, Tahko and Phin B)** – This landscape is characterised by flat land surrounded by rolling hills and high mountain terrain possessing a mixture of primary, regenerated fallow and young fallow areas of high biodiversity value. Small streams run through the village landscape. Village



residential areas are surrounded by un-stocked forests serving as burial, spirit and village use forests. Swidden agriculture is carried out in areas nearby the village settlement.

- **Upland with stream close to primary forest (Ban Atouk and Lahang)** – With flat terrain surrounded by rolling terrain working up to the forested mountain areas, there is a rich mixture of primary, regenerated fallow and use fallow areas of high biodiversity value. Xe Xap NPA and Xelamang Production Forest are key primary forested areas. Small streams run through the village landscape. Village residential areas are surrounded by un-stocked forests serving as burial, spirit and village use forests. Swidden agriculture is carried out in areas nearby the village settlement.
- **Riverine flatland and foothills (Ban Achu Leng, Achung Nhai, Lava Thai and Phin A)** – Flat landscape positioned on gently sloping banks of the Sepon River rising to rolling terrains and mountainous areas which possess a mixture of primary, regenerated fallow and use fallow areas of high biodiversity value. Seasonal streams flowing through landscape into the Sepon river. Village residential areas with the exception of Phin A are surrounded by a mixture of un-stocked and stocked forests serving as burial, spirit and village use forests. For Phin A mountainous forests 2 and 7km away are important assets. A large wetland called Kapouk Kayyiane lies close to Ban Lava Tai. Pine Forest found along Sepon river near Ban Achung Nhai.
- **Elevated landscape (high altitude)** – (Not visited)
These areas have been well documented by previous biodiversity assessments in Xe Xap National Protected Area which forms part of the Central-Southern Annamite Mountains. Altitude ranges from between 400 metres and 2066 metres above sea level. The landscape consists mainly of steep terrain with high plateaus at about 1400 metres above sea level (IUCN/DoF 2004). The area is an important watershed for the Xe Lanong and Sepon rivers which flow northwards into the Xe Banghieng in Savannakhet and the Xe Lon and Xe Sap rivers flowing southwards and feeding into the Xe Kong River. Main forest types are Evergreen forest, Semi-evergreen forest and evergreen wood/shrub land (IUCN/DoF 2004). Steingmetz 1999 also indicates that pine forests are significant. These habitat and size are listed in the below table. Other habitats features include numerous waterfalls, rocky cliff faces and Rhododendron forests at high elevations (IUCN/DoF 2004).

Box 2.8: Samoi Field Example - Ban Achungleng

Ban Achungleng

Ban Achungleng is one of 14 villages in the Atouk cluster, with 28 households. The entire village is of Kado ethnicity. This village is located near the road 15 A in the south and Sepon river in the north and has its boundaries with other villages, such as Ban Meo, Ban Avai, Ban Aho, Ban Adone, Ban Achung Nhai, and Ban Pong Nohn. Most of village upland fields found close to the village settlement and near the road 15 A.

Food security (Rice shortages supplemented by cassava)

Currently, the village faces major rice shortages, with nearly all households experiencing rice insufficiency for more than 6 months of the year. Rice production is highly dependent on labour as households can only afford to manage one hectare each. Villagers reported that rice production from swidden agriculture is very low due to fast recovery of weeds, particularly imperata grass *nha kha* (*Imperata cylindrica*) which shortens the fallow rotation period from 7 years to 3 or 4 years and intensifies labour requirements for weeding. There is however a large cassava output. During the rice shortage the most severely effected households supplement their diet with cassava. Villagers also buy rice to supplement their diets using income from the sale of poultry and from supplying labour to other households.

Experiences in tree growing and Income from Plantations

Villagers have initiated small-plot bong tree (*Persea kurzii*) plantations which are used for bark collection as well as some coffee and acacia plantations. There are also large areas of acacia plantation that belong to the District Agriculture and Forestry Office (DAFO) nearby the village on both sides of the road 15 A. Villagers showed interested in further tree plantation projects but said they also preferred to have certain areas of natural vegetation in their plantations in order to maintain biodiversity of animals and NTFPs as an alternate livelihood strategy, especially during severe rice shortages.

Biodiversity and livelihood in the forest mosaic

According to Mr. Kohn Vene, village headman, villagers rely mainly on resources of a nearby mountain, *Phou Krang*, and pine forest. In the Phou Krang forest, villagers often cut *mai khene hin* (*Hopea odorata*) for their house construction and now use *mai kheng* (*Dialium cochinchinensis*), *mai champa pa* (*Michelia champaca*), and *mai dou* (*Pterocarpus macrocarpus*.) Villagers have noticed that *mai khene hine* is becoming rare and that some other tree species have disappeared from these forests including *mai kha nhoung* (*Dalbergia cochinchinensis*) and *mai dou* (*Pterocarpus macrocarpus*). Villagers reported that in the pine forest, many *mai kha nhoung* (*Dalbergia cochinchinensis*) are also found. NTFPs, such as rattan, tao shoots, bamboo shoots, bananas flowers, are collected for both household consumption and sale. From 2000 to 2004, *Mai Po Heuang* (*Aquilaria* sp.) was heavily extracted and sold to Vietnam. In addition, villagers collect rattan, bamboo shoots, and wild leaves (*samek*) mostly for their own consumption.

There are rich forests in the area that Ban Achungleng shares with surrounding villages. However, there is a need for agreements to be made between villages to ensure the equitable and sustainable use of these resources. The natural pine forests are of high biodiversity value and should be protected.

Part 3 – Status of biodiversity in the project area including ecosystem services and conservation issues

The landscape-level analysis presented above provides insights into the human-natural inter-linkages as they play out on the ground. A number of issues have arisen concerning how major changes to the landscape may affect local ecological and social systems. For a discussion of the status of biodiversity in the project area, information gathered in the landscape analysis is combined with secondary data to provide a snapshot at the district level. It is important to zoom out from village to district at this point, because many of the decisions that affect whether and how a project will move forward are made at the district level. Given the central role the district envisions for its staff in monitoring the project, it was deemed appropriate that biodiversity data be summarized at this scale.

3.1 General land use, vegetation and/or habitat types around villages

The general land-use, vegetation and habitat types in and around the villages of the five districts include a mosaic of home gardens, mixed cultivation plots, upland paddy fields, fallow land (shrubland/scrubland), degraded forest, grasslands, riverine forests and dense primary forests. A few villages harboured plantation forests. The main aquatic habitats include networks of streams and rivers, while ponds and marshes were found in some villages visited.

3.2 Structure and composition of plants in different land-use/vegetation types

Home gardens - These include managed areas within the village where houses are located, dominated by planted trees and shrubs. The quality of home gardens range from poorly managed ones (neglected, with a few scattered trees) to fairly well-managed ones (a mixture of several useful trees/shrubs). In general, the old villages consist of home gardens with a variety of useful plants. The common plant species in home gardens visited are highlighted in Table 3.1 below:

Table 3.1 Common plants in home gardens

Family	Species
<i>Palmae</i>	<i>Cocos nucifera</i> (Coconut)
<i>Bombacaceae</i>	<i>Bombax ceiba</i> (Kapok)
<i>Anacardiaceae</i>	<i>Mangifera indicus</i> (Mango)
<i>Fabaceae</i>	<i>Tamarindus indicas</i> (Tamarind)
<i>Moraceae</i>	<i>Artocarpus heterophyllus</i> (Marmi)
<i>Musacecae</i>	<i>Musa balbisiana</i> (Banana)
<i>Caricaceae</i>	<i>Carica papaya</i> (Papaw)

Mixed cultivation plots: Small plots of mixed cultivations include fruits such as banana, papaya, pine apple, orange; tubers/yams such as Cassava; and several species of vegetables.

Fallow land (1-15 years): These are areas abandoned after cultivation of upland rice and/or other crops, and include vegetation communities under different stages of succession, depending on the age of the fallow lands. The more recent fallow areas (ie. less than 2 years) include shrublands dominated by herbaceous weed species (including invasive alien plants) and pioneer plant species. The common invasive alien species in recent fallow lands include *Lantana camara* and *Eupatorium odoratum*, which form dense thickets. The older fallow land includes bamboo scrubland and secondary forests dominated by woody vegetation. In general, 4-8 year fallow lands consist of isolated trees and a layer of impenetrable scrub. The common plant species in recent fallow areas and old fallow area visited are highlighted in Table 3.2 & Table 3.3 below:

Table 3.2 Common plants in recent fallow land

Family	Species
Verbenaceae	<i>Lantana camara</i>
Asteraceae	<i>Eupatorium odoratum</i>
Palmae	<i>Rhapis laoensis</i>
Leguminosae	<i>Peltaphorum desyrachis</i>
Liguminosae	<i>Sindora siamensis</i>
Lythraceae	<i>Lagestroemia balansae</i>
Hypericaceae	<i>Cratoxylum formosum</i>
Irvingiaceae	<i>Irvingia malayana</i>
Gramineae	<i>Oxytenantha parviflora</i>

Table 3.3 Recorded plants in old fallow land

Family	Species
Apocynaceae	<i>Wrightia arborea</i>
Flacourtiaceae	<i>Casearia floranos</i>
Myrtaceae	<i>Syzygium cinereum</i>
Graminae	<i>Dendrocalamus spp.</i>
Graminae	<i>Bambusa spp.</i>
Elaeocarpaceae	<i>Muntingia calabura</i>
Meliaceae	<i>Xylocarpus xylocarpa</i>
Leguminosae	<i>Dalbergia cochinchinensis</i>
Pterocarpaceae	<i>Pterocarpus macrocarpus</i>
Dipterocarpaceae	<i>Dipterocarpus alatus</i>

Degraded forests (secondary/primary forests): These are forests which have been subjected to timber extraction, and generally lack large and mature trees. The villagers also use these forests as production forests, for their timber and fuel wood needs.

Relatively undisturbed primary forests: Patches of primary forests occur in hill tops and isolated patches among cleared areas. These are generally dominated by evergreen forests, mixed deciduous forests and dry Dipterocarp forests. In general, these forests include 4-5 strata of vegetation. Some of these forests have been degraded by carpet bombing operations and chemical spray (agent orange) during the Vietnam war (about 3-4 decades ago). The recorded tree species in these forests are highlighted in Table 3.4 below.

Table 3.4 Recorded tree species in degraded forests and primary forests

Family	Species
Evergreen forests	
Lythraceae	<i>Lagerstroemia balansae</i>
Pterocarpaceae	<i>Pterocarpus macrocarpus</i>
Dipterocarpaceae	<i>Hopea odorata</i>
	<i>Vatica harmandii</i>
	<i>Dipterocarpus alatus</i>
	<i>Anisoptera costata</i>
Myrtaceae	<i>Syzygium spp.</i>
Leguminosae	<i>Xylocarpus xylocarpa</i>
Mixed deciduous forests	
Leguminosae	<i>Xylocarpus xylocarpa</i>

Leguminosae	<i>Dalbergia cochinchinensis</i>
Pterocarpaceae	<i>Pterocarpus macrocarpus</i>
Lythraceae	<i>Lagerstroemia balansae</i>
Hypericaceae	<i>Cratoxylum formosum</i>
Gramineae	<i>Oxytenantha parviflora</i>
Tonnidae	<i>Dalium cochinchinansis</i>
Dry Dipterocarp forests	
Diperocarpaceae	<i>Dipterocarpus obtusifolius</i>
Diperocarpaceae	<i>Shorea siamensis</i>
Leguminosae	<i>Sindora siamensis</i>
Gramineae	<i>Oxytenantha parviflora</i>
Hypericaceae	<i>Cratoxylum formosum</i>
Myrtaceae	<i>Syzygium cinereum</i>

Riverine forests: Patches of riverine forests occur along streams and rivers, and include plant communities such as gallery forests dominated by tall trees, short scrubland/bushland and bamboo thickets. The riverine gallery forests are dominated by tall tree species such as *Terminalia* spp. The riverine scrubland/bushland includes species such as *Homonoia riparia*, and others such as *Telectadium*, *Phyllanthus* and *Crateva* spp. These bushland are inundated by floodwater, during the rainy season.

Forest plantations: The scattered patches of forest plantations in the two provinces include Kapok (*Bombax ceiba*), Cashew (*Anacardium occidentale*), Blackwood (*Aquilaria crassna*), Rubber (*Hevea brasiliensis*), Acacia (*Acacia auriculiformis* and *A. mangium*) and Coffee (*Coffea arabica*).

3.3 Species richness of flora in the survey areas

Plants used by local communities: Based on field observations made during current survey and information gathered from local communities, the plant species used by local communities in the five districts ranged from 40 species (Nong District) to 90 species (Vilabouri District) (see Table 3.5, and Annex 3.1 – 3.5). The plant products and life-forms used by local communities included timber species (trees), fuel wood (trees and woody scrub), fruits (in trees and woody scrub), yams and tubers (from herbaceous plants), medicinal plants (woody and herbaceous plants), edible shoots (bamboo and rattan), animal fodder (grasses and other woody/herbaceous plant leaves), tannins/resins and plant material for household uses, including weaving of mats and baskets (ie., bamboo, rattan, reeds etc.) (see Annex 3.1-3.5 for details).

Table 3.5: Species richness of plants used by local communities in the survey area

Vilabouri	Nong	Samoi	Taoey	Sepon
90 species	40 species	43 species	76 species	52 species

Composition of plants in the survey area: Based on current observations and information compiled from secondary sources, more than 500 species of plants have been recorded from the Salavan and Savannakhet provinces (see Annex 4.5 for consolidated plant list). Among the total plants recorded from the survey area, 14 woody plant species are globally threatened (Table 3.6). A majority of the globally threatened plants are dipterocarps.

Table 3.6. Globally threatened plant species in the survey area

Scientific Name	Family	Habitat	Vil	Non	Sam	Tao	Xep
Critically Endangered							
<i>Aquilaria crassna</i>	Thymelaeaceae	Primary and secondary forest	+	+	+	+	+
<i>Dipterocarpus turbinatus</i>	Dipterocarpaceae	Mixed deciduous, evergreen and semi-evergreen forest	+	+		+	+
<i>Shorea thorelii</i>	Dipterocarpaceae	Terrestrial	+	+	+	+	+
<i>Hopea thorelii</i>	Dipterocarpaceae	Terrestrial	+	+	+	+	+
Endangered							
<i>Azelia xylocarpa</i>	Leguminosae	Dense forest, and in transitional areas between evergreen and dry open dipterocarp forest	+	+		+	+
<i>Dipterocarpus costatus</i>	Dipterocarpaceae	Scattered in lowland, hill and upper dipterocarp forest	+	+		+	
<i>Shorea roxburghii</i>	Dipterocarpaceae	Dry evergreen or deciduous forest and bamboo forest, often on sandy soils	+	+	+	+	+
<i>Dalbergia bariensis</i>	Leguminosae	Lowland and submontane broadleaved forest	+		+	+	+
<i>Hopea recopei</i>	Dipterocarpaceae	Terrestrial	+	+			+
<i>Shorea henryana</i>	Dipterocarpaceae	Seasonal wet and dry evergreen forest	+			+	
Vulnerable							
<i>Hopea odorata</i>	Dipterocarpaceae	Lowland riparian forest, moist evergreen forest at higher altitudes	+	+	+	+	+
<i>Dalbergia cochinchinensis</i>	Leguminosae	Open semi-deciduous forests	+	+	+	+	+
<i>Platanus kerrii</i>	Platanaceae	Low altitudes near streams on alluvium, gravel soils or mud flats		+			+
<i>Cunninghamia konishii</i>	Cupressaceae	Evergreen submontane forest	+			+	

3.4 Species richness of fauna in the survey areas

Based on direct field observations made during current survey and reliable information gathered from local communities, the species richness of different groups of vertebrate fauna and butterflies in the survey area is highlighted in Table 3.7 below (see Annex 3.1 – 3.5 for species lists of different groups of fauna in the five districts).

Table 3.7: Species richness of fauna recorded from the survey area

Group	Vilabouri	Nong	Samoi	Taoey	Sepon
Freshwater Fish	13	22	13	04	11
Amphibians	01	04	04	02	02
Reptiles	03	14	18	07	04
Birds	47	21	60	73	11
Mammals	10	28	39	29	21
Butterflies	34	--	--	48	--

Based on current observations and information compiled from secondary sources, the consolidated species richness of different groups of vertebrate fauna recorded from the Salavan and Savannakhet provinces is highlighted in Table 3.8 below (see Annexes 4.1 – 4.3 for consolidated species lists of vertebrate fauna). As evident from the high species richness, birds are the dominant group of vertebrates in the area. Among the total vertebrate species recorded from the survey area, 41 species are globally threatened (Table 3.9). Among the mammals in these two provinces, one in every four species is globally threatened.

Table 3.8 Species occurrence of vertebrate fauna in Salavan and Savannakhet provinces

Group	Total species	Globally Threatened
Freshwater Fish	142	03
Amphibians	34	--
Reptiles	58	05
Birds	384	06
Mammals	95	27

Table 3.9: Globally threatened vertebrate fauna in the survey area

Critically Endangered (CR)							
Scientific Name	Family	Common English Name	Vil	Non	Sam	Tao	Xep
Mammals							
<i>Pseudoryx nghetinhensis</i>	Bovidae	Saola			+		
<i>Rhinoceros sondaicus</i>	Rhinocerotidae	Javan rhinoceros			+		
Birds							
<i>Thaumatibis gigantea</i>	Threskiornithidae	Giant ibis			+		
Reptiles							
<i>Crocodylus siamensis</i>	Crocodylidae	Siamese crocodile				+	

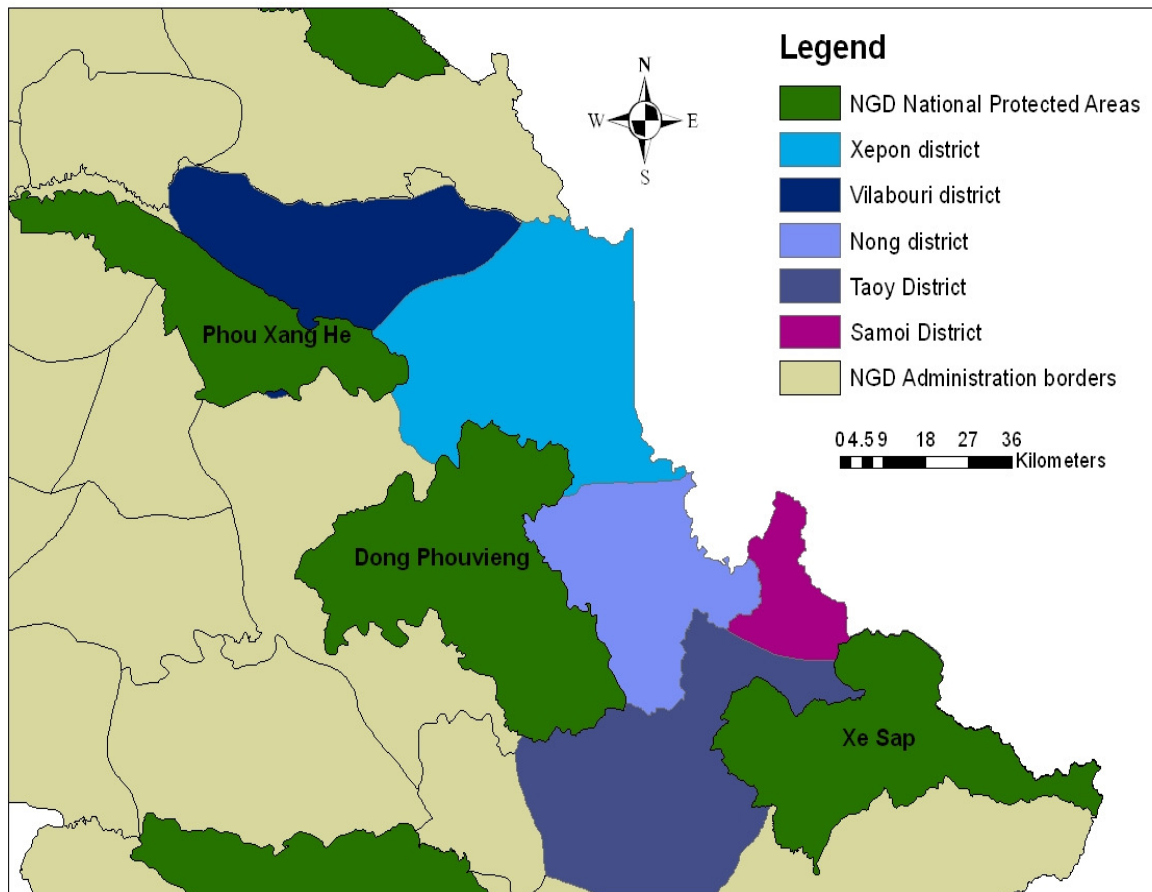
Endangered (EN)							
Scientific Name	Family	Common Name	Vil	Non	Sam	Tao	Xep
Mammals							
<i>Bos javanicus</i>	Bovidae	Banteng				+	
<i>Cuon alpinus</i>	Canidae	Asiatic wild dog			+	+	+
<i>Elephas maximus</i>	Elephantidae	Asian elephant		+	+		+
<i>Hylopetes alboniger</i>	Sciuridae	Particolored flying squirrel	+				
<i>Panthera tigris</i>	Felidae	Tiger		+			+
<i>Pygathrix nemaeus</i>	Cercopithecidae	Douc langur	+	+	+	+	+
<i>Nomascus concolor</i>	Hylobatidae	Black gibbon	+				+
Reptiles							
<i>Indotestudo elongata</i>	Testudinidae	Elongated tortoise			+		
<i>Platysternon megacephalum</i>	Platysternidae	Big-headed turtle			+		
Fish							
<i>Probarbus jullieni</i>	Cyprinidae	Jullien's golden carp					+
<i>Tenualosa thibaudeaui</i>	Clupeidae	Laotian shad					+
<i>Dasyatis laosensis</i>	Dasyatidae	Mekong freshwater stingray					+

Vulnerable (VU)							
Scientific Name	Family	Common Name	Vil	Non	Sam	Tao	Xep
Mammals							
<i>Bos frontalis</i>	Bovidae	Gaur		+	+		+
<i>Capricornis sumatraensis</i>	Bovidae	Serow			+	+	+
<i>Catopuma temminckii</i>	Felidae	Asiatic golden cat	+				+
<i>Cervus eldii</i>	Cervidae	Brow-antlered deer	+				
<i>Chrotogale owstoni</i>	Viverridae	Owston's banded palm civet					+
<i>Hylobates pileatus</i>	Hylobatidae	Capped gibbon		+	+		
<i>Hystrix brachyura</i>	Hystricidae	Malayan porcupine	+				+
<i>Lutrogale perspicillata</i>	Mustelidae	Indian smooth-coated otter					+
<i>Macaca arctoides</i>	Cercopithecidae	Bear macaque	+				
<i>Macaca assamensis</i>	Cercopithecidae	Assam macaque	+				
<i>Naemorhedus caudatus</i>	Bovidae	Chinese goral					+
<i>Neofelis nebulosa</i>	Felidae	Clouded leopard			+		
<i>Nycticebus pygmaeus</i>	Loridae	Lesser slow loris		+	+	+	+
<i>Pardofelis marmorata</i>	Felidae	Marbled cat			+	+	
<i>Prionailurus viverrinus</i>	Felidae	Fishing cat			+	+	
<i>Trachypithecus francoisi</i>	Cercopithecidae	François's langur	+				
<i>Ursus thibetanus</i>	Ursidae	Asiatic black bear		+	+		
<i>Nomascus gabriellae</i>	Hylobatidae	Buff-cheeked gibbon					+
Birds							
<i>Aceros nipalensis</i>	Bucerotidae	Rufous-necked hornbill			+		+
<i>Heliopais personatus</i>	Heliornithidae	Masked finfoot			+		
<i>Leptoptilos javanicus</i>	Ciconiidae	Lesser adjutant			+		
<i>Pavo muticus</i>	Phasianidae	Green peafowl		+	+		
<i>Actinodura sodangorum</i>	Timaliidae	Black-crowned barwing				+	
Reptiles							
<i>Amyda cartilaginea</i>	Trionychidae	Asiatic softshell turtle		+	+	+	
<i>Manouria impressa</i>	Testudinidae	Impressed tortoise					+

3.5 Important localities for conservation of biodiversity in the survey area

Three national protected areas (NPA's) occur within the survey area; Phou Xang He (spanning part of Vilabouri District), Dong Phouvieng (Nong and Sepon Districts) and Xe Sap (Samoi and Taoy Districts) (see map 3.10). According to published sources, these three protected areas harbour a rich biodiversity, including several globally endangered plants and animals.

Map 3.10: National Protected Areas within the study area



Birdlife International has identified three *Important Bird Areas (IBA's)* in close proximity to the project area, including 1) Xe Sap National Protected Area, 2) the Dachang Plateau and 3) Phou Ahyon. Xe Sap is the only *IBA* site which falls within the assessment area, while the other two are located in the wider Xe Sap NPA area. A DoF study reveals that the NPAs evergreen forested mountains and large streams are likely habitats for a number of restricted range bird species including the Crested Argus (*Rheinardia ocellata*), Blyth's Kingfisher (*Alcedo hercules*), and the Yellow-billed Nuthatch (*Sitta solangiae*).²

Village protected forest areas for spiritual purposes including human burials (spirit forests, burial forests) are also important refuges of biodiversity; as such areas are not exploited by local communities due to their cultural significance.

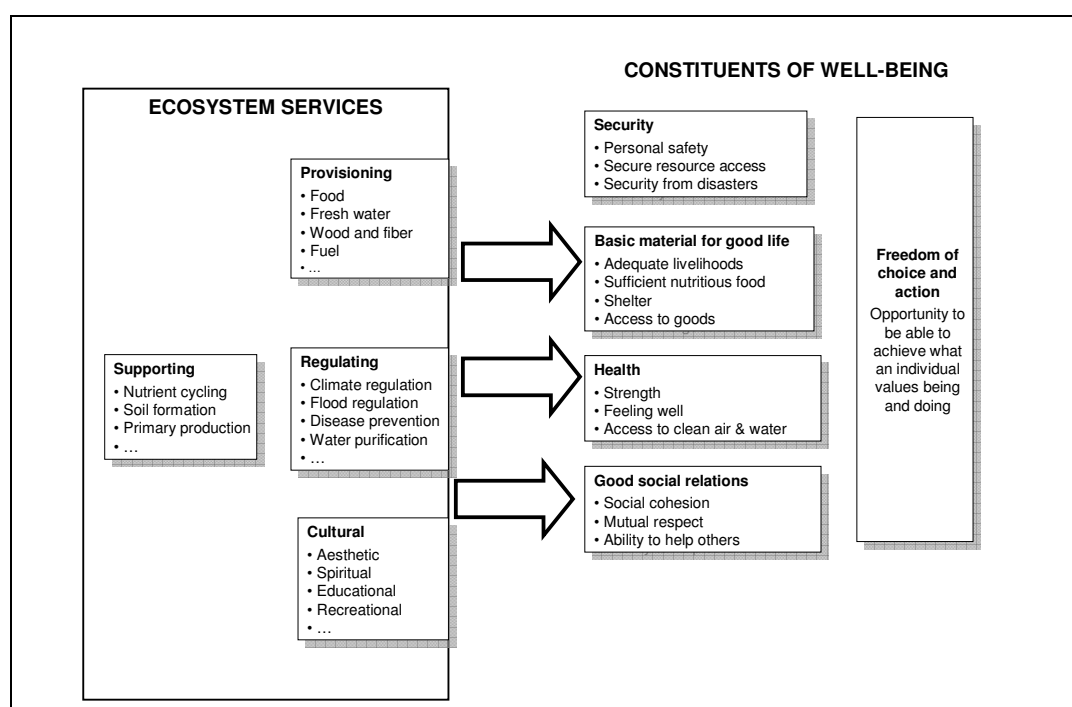
² HCVF Assessment of Phou Thatlava, 2006. Department of Forestry and Provincial Agriculture & Forestry Division Salavan, Unpublished.

3.6 Utilisation of biological resources

3.6.1 Ecosystem services related to biodiversity of the survey area

The Millennium Ecosystem Assessment (2005) provides a useful framework describe the interconnectivity between biodiversity, ecosystem services and human well-being — highlighting the supporting, provisioning, regulating and cultural services that natural ecosystems provide, and the various constituents of human well-being which ensure security, basic materials for a good life, health, good social relations, freedom of choice and action (see Figure 3.11 below).

Figure 3.11: A schematic diagram on the links between ecosystem services and human well-being (Adopted from Millennium Ecosystem Assessment, 2005)



Many rural communities are largely dependent on natural resources for their livelihoods, and therefore any changes in the quantity, quality or accessibility of those natural resources or in people’s access to the resources will affect people’s livelihoods. Examples of the different types of ecosystem services utilized by local communities in the five districts and relevant examples and trends related to each service and trends are highlighted in Table 3.12. The specific uses of plants in the five districts are further highlighted in Annex 3.1 to 3.5 and 4.5.

Table 3.12: A summary of the status of ecosystem services in the five districts

Service components	Examples	Trends
Provisioning Services		
Edible vegetables, Yams and tubers	Edible shoots of bamboo (<i>Bambusa</i> spp.) and Rattan (<i>Dendrocalamus</i> spp.); Edible flowers of <i>Dolichandrone spathacea</i> ; Edible leaves of <i>Passiflora foetida</i> ; tubers/yams of <i>Alocasia</i> spp., <i>Dioscorea</i> spp.,	Variable
Fruit	<i>Syzygium cinereum</i> , <i>Alpinia malacensis</i> , <i>Phyllanthus embilica</i> , <i>Stereospermum fimbriatum</i> , <i>Tamarindus indica</i>	Steady

Timber (for housing)	Almost all village houses are built with timber extracted from forests. Species commonly used include <i>Pterocarpus macrocarpus</i> , <i>Dalbergia spp.</i> , <i>Terminalia spp.</i> , <i>Artocarpus lakoocha</i> , <i>Casearia floranos</i> , <i>Dipterocarpus alatus</i> , <i>Hopea odorata</i> , <i>Vatica harmandii</i> , <i>Lagestroemia balansae</i> and <i>Shorea siamensis</i>	Declining due to over-exploitation for commercial purposes
Fuelwood	<i>Alstonia rostrata</i> , <i>Acacia megdalena</i> , <i>Schima wallichii</i> ,	Steady
Medicinal plants	Fruits of <i>Phyllanthus embilica</i> , Bark of <i>Alstonia scholaris</i> , Fruits of <i>Amomum spp.</i> , <i>Rhapis laosensis</i>	Variable
Resins	<i>Vatica harmandii</i> , <i>Aquilaria crassna</i>	Declining due to over-exploitation
Fish	Catfish, Snakeheads and several Cyprinids	Declining
Wild meat	Wild Boar - <i>Sus scrofa</i> ; Red Muntjac - <i>Muntiacus muntjac</i> ; Many species of forest birds	Wild boar are increasing
Sustenance of ground and surface water	A network of streams and rivers flowing through forest areas supply water for domestic and agricultural use by villagers	Some annual streams have dried out due to forest clearance
Supporting Services		
Biodiversity	High species richness of plants and animals in forests; the primary forests sustain populations of several species of globally threatened plants and animals	Declining due to direct and indirect drivers of change
Nutrient cycling	The organic matter produced by forests supports fishery production in streams and rivers, and also contributes to soil fertility in agricultural lands (ie., in shifting cultivations and irrigated paddy lands)	Loss of soil nutrients due to increased clearance forest
Regulating services		
Carbon sequestration	The vast areas of primary forest cover in the five districts function as valuable carbon sinks	Decreasing due to increased forest clearance and over-harvesting of timber during past 2 decades
Water purification	The fast flowing rocky streams and water fall scattered in the five districts contributes to purify freshwater	Forest clearance has led to erosion and siltation
Cultural Services		
Recreational and aesthetic values	The lush forests, streams and water falls, and the old village landscapes has a potential for tourism	Needs promotion
Sustenance of traditional knowledge	Production of traditional handicrafts (ie., baskets and mats) using bamboo species (<i>Bambusa spp.</i>), rattan (<i>Calamus</i> and <i>Dendrocalamus spp.</i>) reeds and <i>Pandanus spp.</i> ; the practice of traditional medicine and spiritual healing in some villages	Gradual loss of traditional knowledge
Cultural and historic values	Every village has a spirit forest (usually a primary forest), where their ancestors are buried; The Ho-chi-minh trail is of historical importance	Spirit forests are not exploited

3.6.2 Biodiversity and food provision in the study area

Food security and rice production: The Comprehensive Food Security and Vulnerability Analysis (CFSVA)³ conducted by the World Food Programme in 2006, presents a bleak picture of food security in Lao. The report found that one out of every two children in rural Lao is chronically malnourished, affecting both physical development and cognitive capacity. This high level of chronic malnutrition has existed for at least ten years, despite the steady rate of national economic growth. While the level of poor or borderline food consumption is currently at 13 percent of all households, as many as two thirds of the rural population are at risk of becoming food insecure. Livelihood portfolios provide a vital window on this vulnerability. The study found that access to wild meat and aquatic resources, especially wild fish, is the largest source of animal protein. Communities from the Mon-Khmer linguistic group are at particular risk.

The report concluded that the causes of food insecurity are many. A focus on poverty reduction will not be sufficient for overcoming food security issues in currently insecure and vulnerable populations. A combination of education, hygiene and nutrition, physical infrastructure and the agriculture and environmental approaches is necessary. The report recommends, among other things, sustainable management of wildlife and aquatic resources, with particular consideration of competing demands on forest resources. Kitchen gardens are identified as priority interventions, as the report found that households with kitchen gardens are generally more food secure. The report also stresses the linkages between physical infrastructure, production and marketing in contributing to reduction of food vulnerability. Provision of basic sanitation and clean water facilities must be accompanied by instruction and awareness raising. Finally, the demonstrated positive correlation between food security and education suggest that basic literacy, especially among women, should be prioritized.

In Lao PDR, the term 'food security' has typically been considered to mean sufficiency in rice production. In recent years, with the rapid expansion of new markets into rural areas, there is more concern with local capacity to supplement rice deficits by purchasing rice with cash obtained through commercial crop production. The lessons from the nutrition study above clearly demonstrate that a more nuanced understanding of food security must be adopted. A full nutritional study and food security study of the villages was outside the scope of this study. However, data gathered on basic livelihood strategies was analysed to the extent possible through a somewhat broader food security lens. The picture presented in Table 3.13 below is indicative.

Table 3.13 Food security and rice sufficiency (based on data gathered in target villages)

District	Year-round rice sufficient households (%)	7-9 months per year rice sufficient households (%)	4-6 months per year rice sufficient households (%)	3 months or less per year rice sufficient households (%)	Average household rice sufficiency (months/year)
Vilabouri	56.4	30.9	12.7	0	--
Sepon	--	--	--	--	6
Nong	0	7.3	55.7	37	--
Taoy	9.8	9.8	18.4	62	--
Samoi	0.8	15.6	22.7	39.6	--
Percentage	17.46	16.56	28.54	37.43	--

Aside from Vilabouri district, table 3.13 shows that villagers have serious problems accessing rice throughout the year. To deal with rice shortage, some villagers borrow rice from relatives within the community (often at high interest rates) or purchase rice on the market. In some villages, particularly in

³ *Comprehensive Food Security and Vulnerability Analysis*. 2007. World Food Programme.

Samoi district, it is common to grow cassava as a cash crop and purchase rice with the money earned from selling the cassava. Even with these response mechanisms, it is not uncommon to find households unable to obtain sufficient rice.

Harvest of edible wild plants: Wild vegetables are an important part of the local diets. Villagers in all survey villages collect shoots, leaves, roots and yams from natural forest and managed regenerating forest. Areas such as riverine forest habitats in particular harbour many of these edible plants, while upland fallow forest is also a source of several important edible plants. The following table (3.13) presents some of the key wild plant species that contribute to local diets. It is interesting to note that local people perceive many of these plants to be abundant, and some of them in steady supply.

Table 3.13 Key plant species used for food in village landscapes in the study area

Common Name	Scientific Name	Lao Name	Habitat	Status	Trend
Edible Shoots					
Rattan shoots	<i>Calamus viminalis</i>	Wai toon	Open area and near stream	A	D
Bamboo shoots	<i>Gigantochloa apus</i>	Mai lai	Evergreen forest and near stream	A	ST
Bamboo shoots	<i>Neohouzeana mekongensis</i>	Mai ka sa	Evergreen forest and near stream	A	I
Bamboo shoots	<i>Oxytenanthera parviflora</i>	Mai soth	Evergreen forest and near stream	A	I
Lao lady palm shoots	<i>Bambusa tulda</i>	Mai Bong	Near stream	A	ST
	<i>Rhapis laoensis</i>	Saan	Evergreen forest	A	ST
Sugar palm shoots	<i>Arenga westerhoutii</i>	Tao	Evergreen forest and near stream	R	D
Edible fruits					
Ambra	<i>Spondias pinnata</i>	Mak kok	Evergreen forest and near stream	N/A	N/A
Edible leaves					
Wild water lemon	<i>Passiflora foetida</i>	Phak bouang	Fallow land	A	I
Eugenia	<i>Eugenia zeylanica</i>	Phak samek	Dipterocarp forest	C	ST
Edible roots, tubers and yams					
Galangal	<i>Alpinia</i> spp.	Kha pa	Dipterocarp forest	A	I

Status – (A) Abundant, (C) Common, (S) Scarce; (R) Rare - (as perceived by villages)

Trend – (I) Increasing; (St) Steady; D (Declining) – (as perceived by villages)

Edible cultivated crop varieties: Apart from the rice varieties grown in upland and irrigated lands, several other edible annual crops are grown in the survey villages using permanent home gardens and swidden cultivation land, including fruits, vegetables, and yams (see Table 3.14 for common edible crops in the survey areas).

Table 3.14 Edible annual and/or perennial crop species grown in village landscapes

Common Name	Scientific Name	Lao Name	Cultivation area
Vegetables (leaves, pods, flowers, shoots etc)			
Wild water lemon	<i>Passiflora foetida</i>	Pak bouang	Garden
Lime	<i>Citrus</i> spp.	Mak nao	Garden
Cabbage	<i>Brassica oleracea</i> var. <i>capitata</i>	Kalampi	Garden
Papaya	<i>Carica papaya</i>	Mak hong	Garden
Banana	<i>Musa balbisiana</i>	Mak kouay	Garden
Cucumber	<i>Cucumis sativus</i>	Mak teang	Garden

Watermelon	<i>Citrullus lanatus</i>	Mak mo	Garden
Chili	<i>Chilli</i> spp.	Mak phet	Garden
Tubers and Yams			
Cassava	<i>Manioc esculenta</i>	Man tonh	Swidden areas
Peanut	<i>Arachis hypogea</i>	Thoua dind	Garden
Bean	Leguminosae family	Thoua	Garden
Spring onion	<i>Allium</i> spp.	Pak boua	Garden
Sweet potato	<i>Impomoea batatus</i>	Man dang	Garden
Fruits (annual and perennials)			
Jack fruit	<i>Artocarpus</i> spp.	Mak mii	Home gardens
Mango	<i>Mangifera indica</i>	Mak muang	Home gardens
Guava	<i>Psidium</i> spp.	Mak siida	Home gardens
Papaya	<i>Carica papaya</i>	Mak houng	Home gardens
Banana	<i>Musa paradisiaca</i>	Mak kouay	Home gardens
Pineapple	<i>Ananas comosus</i>	Mak nat	Swidden land, home gardens
Orange	<i>Citrus</i> spp.	Mak kiang	Home gardens

Fish and wild meat: Several species of wild animals also form important components of the diet of local villagers (see Table 3.15). Some of these species have become scarce due to over-exploitation for consumption.

Table 3.15. Key wild animal species used for food in village landscapes in the study area

Common Name	Scientific Name	Lao Name	Habitat	Status	Trend
Freshwater fish					
Ray-finned carp	<i>Poropuntius</i> spp.	Pa Chat	RS, Xe, Houay	A	I
Dwarf snakehead	<i>Channa gachua</i>	Pa Kong	RS, Xe, Houay	C	St
Spotted barb	<i>Puntius aurotaeniatus</i>	Pa Khao	RS, Xe, Houay	A	I
Snakehead murrel	<i>Channa striata</i>	Pa kho	RS, Xe, Houay	C	St
Swamp eel	<i>Monopterus albus</i>	Iyan	RS, Xe, Houay	A	I
Amphibians					
Frog	<i>Rana limnocharis</i>	Koo	RS, Xe, Houay	C	St
Crab		Ka Pou	RS, Xe, Houay	A	I
Common Lowland Frog	<i>Rana</i> spp.	Khet	RS, Xe, Houay	C	St
Toad	<i>Kaloula mediolineata</i>	Aueng	RS, Xe, Houay	C	St
Reptiles					
Gekkos.		Kabke	DSF	C	St
Four-eyed Turtle	<i>Indotestudo elongata</i>	Tao Phek	DSF	C	St
Fresh water Turtle-	<i>Amyda</i> spp.	Pa Fa	RS, Xe, Houay	C	St
Green snake	<i>Trimeresurus gramineus</i>	Ngu Kiaw	RB	C	St
Bangal Monitor	<i>Varanus bengalensis</i>	Len	DSF	C	St
Birds					
Red Junglefowl	<i>Gallus gallus</i>	Kai Pah	DPF, DSF,FA,	C	D

Egret	<i>Egretta</i> spp.	Nok yang	DSF,FA	C	I
Large-billed Crow	<i>Corvus macrohynchos</i>	Ka	DPF, DSF,FA, HG	C	S
Parakeets	<i>Psittacula</i> spp.	Nok Kang	DSF,FA	C	I
Hill Myna	<i>Gracula religiosa</i>	Nok Cheowcha	DPF, DSF,FA, HG	C	St
Mammals					
Red Muntjac	<i>Muntiacus muntjac</i>	Fan lau	DPF, DSF,FA,	A	I
Wild Boar	<i>Sus scrofa</i>	Mu Pah	DPF, DSF,FA,	A	I
Roosevelts' Muntjac	<i>Muntiacus rooseveltorum</i>	Fan Dong	DPF, DSF	C	S
Otter	<i>Lutra</i> spp.	Nak Nam	RB	C	S
Large Spotted Civet	<i>Viverra megaspila</i>	Ngen hang kan	DPF, DSF,FA	C	S
Asiatic Black Bear	<i>Ursus thibetanus</i>	Mii	DPF, DSF	C	St
Giant Flying Squirrel	<i>Ratufa bicola</i>	Bang Lua	DSF,FA	C	St

Habitat: DPF – Dense primary forest, DSF – Degraded secondary forest, HG – Home gardens, FA – Fallow land, St – streams, P – Ponds, PF – paddy fields

Status – (A) Abundant, (C) Common, (S) Scarce; (R) Rare - (as perceived by villages)

Trend – (I) Increasing; (St) Steady; D (Declining) – (as perceived by villages)

Livestock raising: Livestock keeping is a common practice in all villages. Most households would usually have poultry (chicken/ducks/turkey) and pigs, while a few households in a village would own goats, cattle and/or buffalo (see Table 3.16 for statistics on livestock per household, based on data gathered during current survey).

Table 3.16 Importance of livestock to villagers in the study area by district

District	Buffalo (Average animals per household)	Cows (Average animals per household)	Pigs (Average animals per household)	Goats (Average animals per household)	Poultry (Average animals per household)
Nong	0.5	0.8	0.7	0.7	2.8
Sepon	0.7	0.6	0.1	0.6	-
Vilabouri	1.4	2.4	0.5	0.2	2.7
Taoy	1.3	1.1	1.2	0.2	7.4
Samoi	0.4	0.9	1.0	0.4	3.2

Vilabouri and Taoy districts have the highest average number of large livestock per household. Nong and Samoi have particularly low large livestock. Although the current study could not gather detailed data on trends, this snapshot does indicate the low levels of livestock to be one cause of poverty and insecurity. Some anecdotal evidence from the fieldwork in Sepon district suggest that livestock are declining, mainly because it is necessary to exchange livestock for cash to meet basic needs. The prevalence of frequent diseases in some areas of the Taoey District have also resulted in large scale mortality of domestic animals.

3.6.3 Trade of species:

With rice shortages across the study districts, trade in natural and domesticated products provides the bulk of the cash that villagers use to obtain rice (See tables 3.17 and 3.18). Some products are sold within the village or at local markets; others are sold primarily to Vietnamese traders at higher prices

and in larger quantities. It is important to note that some of the most valuable species are reported to be rare and declining (See 'Status' and 'Trend' in tables 3.17 and 3.18).

Table 3.17. Key traded species in the Savannaket province

Common Name	Scientific Name	Lao Name	Details of trade (selling price)	Habitat	Status	Trend
Wild Timber species						
Rosewood	<i>Dalbergia</i> spp.	Mai ka cha	Timber for export; (\$1,000m ³)	Evergreen forest	A	ST
Burma Padauk	<i>Pterocarpus macrocarpus</i>	Mai dou	Timber for export; (\$600m ³)	Evergreen forest	A	D
Thailand Rosewood, Tracwood	<i>Dalbergia cochinchinensis</i>	Mai kha nhoung	Timber for export; (\$5,000m ³)	Evergreen forest	R	D
Beng	<i>Azelia xylocarpa</i>	Mai tea kha	Timber for export; (\$800m ³)	Evergreen forest	R	D
Burmese Rosewood	<i>Dalbergia bariensis</i>	Mai kamphée	Timber for export; (\$3,000m ³)	Evergreen forest	R	D
Non-timber forest products (edible parts etc.)						
Bamboo shoots	<i>Bambusa</i> spp.	No mai	Local and export	Evergreen forest	A	I
Rattan shoots	<i>Calamus</i> spp.	No wai	Local and export (dry shoots)	Evergreen forest	R	ST
Palm shoots	<i>Arenga westerhoutii</i>	No tao	Local (shoots) food	Evergreen forest	R	ST
Galangal	<i>Alpinia</i> spp.	No kha	Local (Shoots, Turber) food	Evergreen forest	A	I
Cardamom	<i>Amomum</i> spp.	Mak Neng	Local (fruit) food and medicine	Evergreen forest	A	ST
Wild Animals						
Giant Flying Squirrel	<i>Ratufa bicolor</i>	Bang Lua	Local and export	DPF, DSF	C	S
Pangolin	<i>Manis javanicus</i>	Liin	Local and export	DPF, DSF	S	R
King cobra	<i>Ophiophagus hannah</i>	Ngou jong ang	Local and export	DPF, DSF	S	R
Fresh water Turtle	<i>Amyda</i> spp.	Pa Fa Ong	Local and export	RB	C	S
Reticulated Python	<i>Python reticulatus</i>	Ngou Luam	Local and export	DPF, DSF, FA	S	R
Domesticated Animals						
Buffalo	<i>Bubalus</i> spp.	Khuay	Domestication and export	From the villages	R	D
Cow	<i>Bos</i> spp.	Ngua	Domestication and export	From the villages	A	ST
Poultry	<i>Gallus</i> spp.	Sat Piik	Domestication	From the villages	C	D
Goat	<i>Capra</i> spp.	Bae	Domestication	From the villages	A	ST
Pig	<i>Sus</i> spp.	Mou	Domestication	From the villages	C	D

Table 3.18. Key traded species in Salavan province

Common Name	Scientific Name	Lao Name	Details of trade (selling price)	Habitat	Status	Trend
Wild Timber species						
Rosewood	<i>Dalbergia</i> spp.	Mai ka cha	Timber for export; (\$1,000m ³)	Evergreen forest	A	ST
Burma Padauk	<i>Pterocarpus macrocapus</i>	Mai dou	Timber for export; (\$ 600m ³)	Evergreen forest	A	D
Thailand Rosewood, Tracwood	<i>Dalbergia cochinchinensis</i>	Mai kha nhoung	Timber for export; (\$ 5,000m ³)	Evergreen forest	R	D
Beng	<i>Afzylia xylocarpa</i>	Mai te kha	Timber for export; (\$800m ³)	Evergreen forest	A	D
Burmese Rosewood	<i>Dalbergia bariensis</i>	Mai khamphee	Timber for export; (\$3,000m ³)	Evergreen forest	R	D
Non-timber forest products (edible parts etc.)						
Bamboo shoots	Poaceae Bambusoideae (family/ subfamily)	No mai	Local and export	Evergreen forest	A	I
Rattan shoots	Palmaceae (family)	No wai	Local and export (dry shoots)	Evergreen forest	R	ST
Palm shoots	<i>Arenga westerhoutii</i>	No tao	Local (shoots)	Evergreen forest	R	ST
Galangal	<i>Alpinia malacensis</i>	No kha	Local (Shoots, Tubers)	Evergreen forest	A	I
Eugenia	<i>Eugenia zeylanica</i>	Pak samek	Local (fruit , young leaf) food and medicine	Dipterocarpus	A	ST
Wild animal species						
Sambar Deer	<i>Cervus unicolour</i>	Kuang	Traded by villagers	DPF, DSF	C	S
Wild Boar	<i>Sus scrofa</i>	Mu Pah	Traded by villagers	DPF, DSF,FA	A	I
Red Muntjac	<i>Muntiacus muntjac</i>	Fan lau	Traded by villagers	DPF, DSF,FA	A	I
Pangolin	<i>Manis javanicus</i>	Liin	Traded by villagers	DPF, DSF	S	R
King cobra	<i>Ophiophagus hannah</i>	Ngou jong ang	Traded by villagers	DPF, DSF	S	R
Domesticated animal species						
Buffalo	<i>Bubalus</i> spp.	Khuay	Domestication and export	From the villages	R	D
Cow	<i>Bos</i> spp.	Ngua	Domestication and export	From the villages	A	ST
Poultry	<i>Gallus</i> spp.	Sat Piik	Domestication	From the villages	C	D
Goat	<i>Capra</i> spp.	Bae	Domestication	From the villages	A	ST
Pig	<i>Sus</i> spp.	Mou	Domestication	From the villages	C	D

3.7 Conservation issues and threats

Direct drivers of change affecting biodiversity and related ecosystem services

The Millennium Ecosystem Assessment (2005) identified many drivers of biodiversity loss at a global scale, among which the primary drivers were: habitat change, overexploitation of species, invasive alien species, pollution and climate change.

The direct drivers of change that influence the biodiversity in the five districts includes land conversion, bombing and chemical spraying during the US-Vietnam War (causing degradation of forest landscapes), over-exploitation of plant and animal species, and the spread of invasive alien species.

Haphazard and unregulated clearing of forests for slash-and-burn (swidden) cultivation by local communities is prevalent in all five districts. This has led to the reduction of forest cover, and fragmentation of forest habitats. The practice of setting fire during the land clearing phase of swidden cultivations has also led to the degradation of adjoining forests. The increased incidences of crop damage by wild animals (such as elephant, wild boar, deer and birds etc.) reported by some villages could be directly related to the loss of their forest habitats.

Several species of invasive alien plants -- for example Siam Weed (*Chromolaena odorata*), Lantana (*Lantana camara*), Mile-a-minute (*Mikania micrantha*) – are thriving in fallow lands and degraded forests. These exotic species usually out-compete native plant species, including those used by local communities.

Haphazard exploitation of timber from lush primary forests has also led to qualitative degradation of such forests. Over-Hunting of wild animals is a common practice among villages, and this has led to the decline and local extirpation of many species of medium and large mammals in the survey areas. Over-exploitation of species seems to have increased over the past decade, with the arrival of timber traders from Vietnam. Wildlife (mammals, birds and reptiles) is commonly displayed along roadsides, since the Vietnamese timber truck drivers readily buy them.

Indirect drivers of change affecting biodiversity and related ecosystem services

The main indirect drivers of change that influence biodiversity in the five districts include economics-related market forces (such as timber exploitation carried out by Vietnamese traders), weak governance mechanisms, inadequate regulation of natural resource exploitation (including demarcation of land use around villages), lack of alternative livelihoods opportunities or capacity for alternative livelihoods among local communities and increasing population pressure in villages.

Table 3.18 A summary of drivers of change influencing biodiversity in the five districts, and their implications on ecosystem services and human well-being

Direct drivers of change	Indirect drivers of change	Implications for ecosystem services	Implications for human wellbeing
Clearance of forest cover for haphazard expansion of swidden cultivations	Poor agricultural practices adopted in agriculture; Inadequate knowledge on suitable agricultural practices to increase productivity in existing arable land; lack of alternative livelihoods; inadequate regulation of land-use	Decrease of forest biodiversity and related provisioning services; Decrease of surface and ground water resources; Heavy erosion of soil leading to siltation of streams and rivers	Increased incidences of crop damage by wild animals; Decrease of forest products for domestic/commercial use; Inadequate crop yields for year-round consumption; Flash floods affecting bank cultivations and

			households during rainy season; dry season water scarcities affecting households and livestock;
Over-exploitation of timber species by Vietnamese timber merchants	Improper forestry practices leading to damage of non-target plant species; Lack of regulation and monitoring of timber extraction operations; Income opportunities for selected influential villagers and administrators; lack of village empowerment	Decrease of forest biodiversity and related provisioning services; Decrease of surface and ground water resources; Heavy erosion of soil leading to siltation of streams and rivers	Decrease of timber species and other forest products for domestic use; Flash floods affecting bank cultivations and households during rainy season; dry season water scarcities affecting households and livestock;
Poaching	High demand for wild meat by Vietnamese timber extraction workers (ie., truck drivers and labourers); scarcity of domestic animals due to disease related mortalities	Decline of reptiles, birds and mammals	Loss of income opportunities related to ecotourism; Increase of crop damage due to proliferation of rodent pests; Scarcity of wild meat for domestic consumption
Spread of invasive alien plants	Forest clearance for swidden cultivation and timber extraction	Decline of native plant biodiversity	Human health implications (ie., increased respiratory diseases due to seasonal spread of Siam weed pollen); Decrease of NTFP's from native plants
Harmful fishing practices (is., use of small-mesh size nets)	Food scarcities	Decline of freshwater fish species	Decline of fish for domestic consumption

3.8 Potential impacts on biodiversity related to the plantation project

Potential negative impacts of plantation projects on biodiversity include

- Increased pressure on forest and wildlife resources
 - Over-exploitation of wild animals and plants due to improved access through new road networks
 - Illegal poaching, felling of timber species and over-exploitation of NTFP's
 - Fragmentation of habitats and/or disruption of seasonal migratory routes of wild animals
 - Accidental mortality of wild animals (related to clearing operations and road-kills)
 - Spread of fire into wild habitats during the clearing phase
 - Further conversion of primary forests into swidden cultivation by villagers (to continue the shifting cultivation practice in new areas, due to loss of fallow lands for the forest plantations)
- Potential degradation of aquatic habitats (and resultant impacts on aquatic organisms that prefer pristine waters)

- Siltation of streams due to soil erosion during the land preparation phase
- Disruption of stream flow due to roads and tipping soil directly into gullies or water courses or over the edge of the road
- Pollution of aquatic habitats from agro-chemical run-off during maintenance phase
- Chemical fertiliser run-off and resultant eutrophication of aquatic habitats
- Biocide residues leading to pollution of aquatic habitats
- Establishment and spread of invasive alien species
 - Accidental introduction and spread of invasive alien flora through seed material trapped in vehicles and other equipment used for the forestry operations

Part 4 Management of biodiversity resources in the study area

4.1 The legislative and policy framework governing biodiversity conservation in Lao PDR

The Government of Lao has formally recognised the importance of the country's biodiversity in national policy and over the last 20 years it has significantly strengthened the framework governing the protection of these resources. The legislative framework is reflected in the National Biodiversity Strategy to 2020 and Action Plan to 2010 as the guiding platform under the Convention on Biological Diversity (CBD). Other documents of relevance include the Environmental Protection Law (1999), Decree 164/PM on the Establishment of the Lao PDR National Protected Area System (1993), Regulation on the Management of NBCAs, Wildlife and Aquatic Animals No. 0360 (2003), Forestry Law (2005 revised 2007), the Wildlife Law (2007), Land Law (2003), Water and Water Resources Law (1996), the Forestry Strategy 2020 (2005). Table 4.1 summaries these key documents and how they relate to the sustainable use and management of biodiversity.

Table 4.1: Legislative Framework Pertaining to Biodiversity Conservation in Lao PDR

Legislative document	Description
National Biodiversity Strategy to 2020 and Action Plan to 2010	Lao PDR became a party to the Convention on Biological Diversity (CBD) in 1996. In accordance with CBD guidelines, and with IUCN support, Lao has recently completed a National Biodiversity Strategy and Action Plan which highlights current threats to biodiversity and priority areas for engagement. In 2004, the Lao government completed the National Biodiversity Strategy to 2020 and Action Plan to 2010 (NBSAP). It outlines seven areas of work that will be implemented in order to reach the overall goals of the strategy. The main objectives of the NBSAP include: to improve biodiversity data and fill data gaps through basic and applied research, to improve biodiversity management and monitoring, to harmonise legislation and regulations related to biodiversity to MEAs, and to increase public awareness and participation in sustainable management of biodiversity (NBSAP 5). Human Resource Development is a key component of this strategy, which emphasizes that improved capacity, with respect to both decision-making and research, is necessary for sustainable biodiversity conservation.
Prime Minister's Decree 164 on the Establishment of National Biodiversity Conservation Areas (1993)	Decree 164/PM of October 1993 is among the first legislations enacted by the Government of Lao PDR which establishes the National Protected Area System, an objective of which is to preserve natural resources including the forest, wild animals and water. The establishment of the NPA system lays a good foundation towards comprehensive conservation of Lao PDR biodiversity. Management of the NPAs has received further development in subsequent regulations aiming at protecting biodiversity and sustainable natural resource utilization.
Environmental Protection Law (1999)	The Environment Protection Law addresses the protection of the environment and natural resources as well as biological diversity (Article 15). The law also provides the basis for conducting project-related Environmental Impact Assessment to reduce and mitigate environmental impact, accordingly a Regulation on Conducting Environmental Impact Assessment in Lao PDR was subsequently issued.

<p>Forestry Law (2005, amended 2007)</p>	<p>Biodiversity conservation is covered in the first Forestry Law where biodiversity is provided under the forest resources which individuals and organisations have the obligation to protect. The law was amended in 2007. Key amendments include classification of forestland into three categories as opposed to five in the previous version. A specific section is devoted to forest preservation, which deals with the conservation of plants and animals and NTFP species. The law also provides for organisations having the rights to make decisions concerning land conversion and approval of concessions.</p> <p>The law defines the nature, functions, objectives and legal status of conservation forest with the aim to protect and conserve biodiversity and requires the government to engage participatory management of protected areas with villagers. It also provides for zoning within the national protected areas into totally protected zones, controlled use zones and corridor zones.</p>
<p>Law on the protection of wildlife and aquatic animals (2007)</p>	<p>A new law on the protection of wildlife and aquatic animals was recently enacted and passed by the National Assembly in late 2007. This enactment signifies the growing importance of wildlife and aquatic animal conservation and protection in Lao PDR. As a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) the enactment reinforces Lao PDR's obligation on the protection and management of wild fauna under this Convention.</p> <p>The law sets out the principles, regulations and measures to protect, enhance and manage fauna biodiversity sustainably. It provides the basis for the different level of protection in respect of the three national wildlife and aquatic animal category lists: List I (prohibited), II (managed) and III (general category), and their management requirements. What is important is that the law calls for the formulation of a general wildlife management, development and protection strategy that sets out the direction, action plans, projects and measures on an immediate and long-term basis. The law also provides the framework for the inventory, uses, import and export of wildlife and aquatic animals on a managed basis.</p>
<p>Regulation on the Management of National Protected Areas, Aquatic and Wildlife (2003)</p>	<p>Practical management of National Protected Areas is exercised by applying the Regulation on the Management of National Protected Areas, Aquatic and Wildlife (No. 0360 of Dec. 2003). This regulation provides for the national protected area establishment procedures, the distinction of conservation zones, planning and development of a protected area management plan, and prohibitive activities that can cause detrimental impact on wildlife and aquatic animals, as well as the institutional management responsibilities. The regulation also lists the Lao PDR prohibited wildlife and aquatic animal species category I and managed species category II.</p>
<p>Water and Water Resources Law (1996)</p>	<p>This law provides a comprehensive framework for the use, development and protection of water and water resources in both quantity and quality, including water-related biodiversity. The law sets out the obligations and principles for the development and protection of water sources and resources, including environmental protection. A specific category of water source pertaining to biodiversity conservation is defined in the law to protect biodiversity of plants and animals and the natural environment having important and special values. For the medium and large-scale use of water and water resources, an environmental impact assessment is required, among other requirements.</p>
<p>Land Law 04/03</p>	<p>The Land Law provides for the allocation of land to individuals, families and</p>

NA, 21 October 2003	organisations for legal use. One of the land user's obligations is to protect the environment, and that land use must not result in land degradation and negative impact on the natural and social environment.
Forestry Strategy 2020 (2005)	In July 2005 the Government of Lao PDR adopted its Forestry Strategy to the Year 2020. This is an official document to guide the sustainable management and development of the forestry sector in line with national policies, strategies and priority programs for national socio-economic development and environmental conservation. It identified 146 actions to be tackled including actions for the conservation and protection of biodiversity. As a comprehensive package, biodiversity conservation the FS2020 calls for improving the legal and regulatory framework, improvement of the management and development of the country national protected area system, controlling wildlife trade, enhancing conservation awareness and strengthening research.

4.2 A snap shot of the management of biodiversity in the study area

Despite the legal framework presented in table 4.1, there remain significant constraints with the implementation and enforcement of legislation due to the limited institutional capacity and financial resources of the responsible government agencies. These constraints are particularly acute at the provincial and local government levels. Through engaging with government officials from across the study area, the assessment team was able to get a better understanding of these constraints and how they are impacting on the roll out of these national biodiversity conservation policies.

4.2.1 Government agencies

The management of biodiversity at the central level falls under the mandate of the Department of Forestry. At the provincial level, the Provincial Agriculture and Forestry Office (PAFO) is responsible for biodiversity management. Similarly at the district level biodiversity management rests with the District Agriculture and Forestry Office (DAFO). Province and district offices under the Water Resources and Environment Agency also have biodiversity conservation responsibilities, including biodiversity and environment policy dissemination and enforcement.

Despite the assignment of responsibility to these agencies, active management of biodiversity in the study area was observed as being low. Very few active biodiversity related projects/programmes were identified during field visits (see table 4.2).

Table 4.2: Current biodiversity conservation programmes in the Study Area

Programme Name	District	Implementer
Community-based Natural Resource Management Project	Samoi, Taoy	Village Focus International
Sepon Gold and Copper Mine Project – impact assessment and management programme	Vilabouri	Oxiana-LXML Ltd.
Phou Xang He NPA Management -- routine programme with limited scale of government support	Part of Vilabouri, and Sepon	Savannakhet Forestry Section in collaboration with offices of districts concerned
Dong Phouvieng Elephant Conservation Project – new initiative to be implemented soon	Nong	Savannakhet PAFO
Biodiversity Management in Production Forests	Taoy	SUFORD

During stakeholder consultations which were held in October 2007, Provincial and District authorities provided the following comments on biodiversity management:

- Baseline information on biodiversity in the study is limited (For example, a district representative from Taoy commented that very few biodiversity studies had been carried out in the district and as a result there was a limited understanding of Taoy's biodiversity and how it is utilised).
- There have been only limited land-use surveys carried out in the project area. This has resulted in illegal occupation of and encroachment on land, affecting the allocation of land for local communities and for production purposes due to ambiguities with land ownership issues.
- Lack of human resources and capacity are still the most formidable barriers to adequately managed biodiversity. There is simply not enough staff to effectively implement the government's policy on biodiversity conservation and current staff members are either over-stretched and/or lack the capacity to carry out their responsibilities.
- Biodiversity assessment and management is rarely undertaken by private sector development projects in the study area (with the exception of Lang Xang Minerals Ltd.) and government agencies have not been able to ensure that this is done effectively.

4.2.2 Traditional/ local biodiversity management

Traditional systems of land use and management, including slash-and-burn and conservation forest are also key forms of biodiversity management in the study area. One key management objective of local systems is maintaining the biodiversity that provides food and fuel for livelihoods. The delicate balance between natural, social and super-natural systems is maintained through peoples' daily practices. In response to the opportunities and threats from larger market forces, local communities adapt within the context of these systems.

The fieldwork for this RPBA provided an opportunity to gather preliminary information on the traditional rotational farming systems of the local communities (see Annex 6). These classifications provide insight into how patches in the landscape mosaic function within local livelihoods. Of particular importance is the higher level of detail of the status and use of fallow fields within local systems. This is of significance because the blanket categories typically seen on land use maps – ie. degraded forest, unstocked forest – often hide the dynamic role these areas play in rotational cultivation systems and natural resources management practices.

4.3 Biodiversity Management - Implications for Stora Enso

One of the challenges for the Stora Enso plantation throughout the project life will be how the company engages with the complex and semi-functional legal governance framework. Already, simply through the commissioning of this biodiversity assessment, the company has provided the catalyst for discussions and field experience on how government should manage the biodiversity and livelihood impacts of development projects and how communities should engage with both company and government representatives on the management of landscapes and sites of biodiversity significance around their villages. There is no doubt that if the plantation project moves forward it will be an important driver of better practice in plantation processes and biodiversity management in the study area and across the country.

Recommendations on how the company might engage these existing institutions and mechanisms is outlined in section 5.3 of this report.

Part 5: Recommendations and tools for the conservation of biological resources in the project area

5.1 General Recommendations on strengthening the Stora Enso plantation process

Given the scope and nature of this study, the recommendations section will not make any statements about whether the proposed project should go ahead or not. Designed as a document to inform a more extensive Environmental and Social Impact Assessment, the recommendations focus on what concerns the company should be aware of, with regards to process, biological diversity and local socio-economy. The recommendations propose areas and directions for further investigation in the ESIA, tools for monitoring biodiversity throughout project life, and general mechanisms for how biodiversity can be enhanced in plantation projects.

Stora Enso has committed to a consultative and informed plantation process. Table 5.1 outlines the company's 'bottom-up' approach which seeks to engage villages at the outset and allow them to make decisions about how any potential plantation is developed in their village landscapes. Ultimately the company aims to improve the welfare of local communities and increase yields of rice and other food crops whilst having a financially viable plantation project.

Table 5.1: Stora Enso Plantation Process

No.	Stage	Stage Description
1	Village involvement	Meetings will be held with villages to discuss negative/positive aspects of the project, and the impact on existing agricultural activities will be discussed.
At this stage the villages will decide whether or not they have any interest in the project.		
2	Socio-economic baseline survey	Data will be collected to obtain a rich description concerning the current socio-economic situation in the village, before the company and the village goes any further in the process.
3	Land survey	All types of land will be surveyed by the company in participation with the community in order to identify the land that can NOT be used for plantation and land that would be suitable for plantation. Spirit forest, protected forest, conservation forest and productive forest will all be surveyed as well as land used for agriculture. Borders of the village land will be mapped. Possible disputes about the borders should be solved by the involved parties.
4	Land acquisition	The data from the land survey will be used in order to produce a village map. The village map will include all types of land that belongs to the village and will be used as a tool and as a foundation to identify potential suitable land for plantation. An agreement to propose suitable land areas for plantation will be signed and sent to the District.
5	Decision-making process	The agreement will be presented to the district. At this stage, the district will proceed with the coming decision process and will further involve the Province and the Lao Government.
If permission is given to use the land for plantation the following step will be carried out		
6	Bush clearing	Villagers will be involved in bush clearing of land and will be paid for this service. During the bush clearing an UXO technician will be present at all times for the safety of the workers.
7	UXO clearing	All land area that will be used for plantation will be 100 % cleared from UXO.
8	Soil preparation	The preparation of soil will be done by the company.
	Tree planting	The land that is suitable for plantation will be divided into seven equal parts. The villagers will have work every year on one of those six parts. The

		company and the village will make a work plan together so the villagers can continue with their normal shifting cultivation, and to be able to work for the company. The company will pay the villagers for all types of work in the plantation, but NOT for planting rice or other agricultural crops in between the planting rows.
9	Intercropping	The villagers will be able to use up to 70 % of the cleared land for growing rice or other agricultural crops between the planting rows. All rice or crops will belong to the villagers, NOT the company. The company will give each family 1 ha (of the land that is used for plantation), where the family can grow crops or rice between the rows. After the harvest of the rice or agricultural crops, area can be used for grazing cows, buffalos and goats.
10	Community development	The company sets itself as a goal to improve the quality of life of the people in its project villages. The company will work with the villages to: <ul style="list-style-type: none"> • Establish a village development fund • Conduct a village needs assessment • Establish a small business development fund

Source: Burapha Group 2007

The Stora Enso Laos Plantation Management Model document outlines some basic principles and processes intended to ensure the sustainability of the project. On the social side, the document includes sections on ensuring community participation and distribution of benefits from land. The targets of this particular agroforestry plantation model are food security for local villagers, additional income and minimizing slash and burn impact on the rest of the village land.

The Land Acquisition section lays out a bottom-up process of steps through which the project will interact with local stakeholders in gaining access to land. The Plantation establishment and management section defines the technical processes to guide the planning and management of the plantation plots. Principles governing the plantation establishment process are elaborated at the landscape, block, village cluster and compartment levels.

If implemented fully, these principles should provide some degree of safeguarding for local biodiversity and the people that depend upon it. However, the degree of detail in the Plantation Model document is rather low, and more specific guidelines for the implementation and monitoring of each step should be elaborated, in conjunction with local stakeholders. The indicators of implementation success should be based on a more detailed understanding of the local conditions.

The IUCN Rapid Participatory Biodiversity Assessment does not make conclusions on the material presented in the Plantation model, as a more detailed assessment should be made in the full ESIA. However, findings from this biodiversity assessment are certainly relevant to consideration of how safeguards might be implemented and monitored, and should inform the ESIA's recommendations.

During the course of the RPBA the IUCN team has interacted with many of the company's stakeholders and has been able to make some important observations about how the plantation process described above is currently being implemented. The following recommendations identify areas where this process could be strengthened and set the scene for more specific recommendations about how the company can manage and monitor the projects impacts on local biodiversity and ensure the enhancement of livelihoods in and around project sites. Specific steps for monitoring and adjustment of the process should be added to the above general project blueprint, and should be stressed with local officials and people so that they understand that there is room for change based on feedback mechanisms.

It is recommended that Burapha/Stora Enso:

Process R5.1.1: Better engage provincial and district government officials to inform them about the details of the project and gain their support in linking the project to local development goals.

During the RPBA provincial/district stakeholder meetings Government representatives were not convinced about the proposed development activity and it was clear that any prior engagement by the company about the project and its unique model had not resinated in these agencies.

Through the IUCN assessment, provincial and district officials from the 2 provinces and 5 districts have now actively engaged this project and are more familiar with the potential positive and negative impacts on biodiversity and peoples' livelihoods, It is recommended that this engagement be continued.

See section 5.5 *Recommendations for linking the project to local programmes*

Process R5.1.2: Review its initial village engagement process to ensure that villagers understand that land has not been predetermined and that the purpose of the meeting is to see if the villagers are interested in the project

During village assessments it became clear that some villages had misinterpreted the purpose of the initial company meeting and rather than understanding it to be an engaging and empowering opportunity, perceived it very much as a top down order from the government to identify land for the company. This misunderstanding may have resulted for a number of reasons such as the significant language barriers that exist in some village consultations and perceptions about the plantation approval process - before the company can visit the village it must get approval from the government in the form of a letter and this may have been understood by villagers as a formal request to allocate land to the project.

This may also be partially due to the top-down nature of large-scale projects in Lao. For this reason, it is essential that Stora Enso make dedicated efforts to demonstrate how transparent projects can be implemented. Provision of best practices and concrete processes for good project governance can be fed into relevant government agencies so that future investors are held to increasingly high standards of performance.

Working across such ethnically diverse districts is a challenge for the company. It is recommended that more time be spent on developing an engagement process which clearly communicates the intentions of the project, the plantation model and the company's commitment to livelihood improvement. To do so, further studies should be conducted to better understand ethnic complexities of the study area.

See section 5.4 *Recommendations for further socio-economic analysis*

Process R5.1.3: Continue to conduct independent, socio-economic baseline surveying to ensure that the variety of issues arising from a potential plantation are presented and options for mitigation and management outlined.

During district stakeholder consultations, officials emphasised the need for more studies like the IUCN RPBA to better understand the project area and the potential impacts of the plantation on people and biodiversity. It is important that further studies continue to be conducted independently from the company.

This assessment has revealed a number of areas in which further study is required:

- Socio-economic studies:
 - Detailed disaggregated analysis for different ethnicities
 - Studies on food security, going beyond rice availability to look at access to food with necessary nutritional value
 - The role of livestock in local livelihoods
 - Valuation of benefits and costs (in 2 different situations – without plantation forest, and with plantation forest)

- Village landscape and biodiversity studies
 - In depth Land-use and land rights studies at the village level
 - Forest regeneration studies

These areas are expanded upon in section 5.4 *Recommendation for further socio-economic analysis*

Process R5.1.4: Expand collaborative land use mapping exercises to eventually cover all districts. Strengthen these exercises with simultaneous socio-economic and biodiversity studies.

The spatial mapping exercises should be conducted to facilitate proper zoning of areas in each district, including areas important for biodiversity conservation, establishment of plantation sites and community agricultural land.

Process R5.1.5: Strengthen biodiversity considerations in the plantation preparation phase by adopting recognised guidelines for the conservation of biodiversity in plantation projects

See section 5.1.1 b) *Guidelines for selection of suitable sites for establishment of plantation forest plots*; and c) *Guidelines for land clearing phase*

Process R5.1.6: Review the timing of the plantation preparation phase to ensure that the plantation and intercropping schedule provides optimal benefit for the plantation and for livelihood crops.

Due to the request for land by the company and land use competition in the area, it is recommended that the company review the implementation of its plantation policy / process to ensure that is being followed adequately, including timing for both plantation and the intercropping practices that will benefit the company, but also provide adequate grazing ground for cattle. In addition, awareness raising and capacity building for local communities for plantation activities are highly recommended as to get local people's participation and sharing the benefit of plantation activities along, including nursery establishment or involvement them in seedling preparation and planting.

Process R5.1.7: Initiate biodiversity monitoring programmes to monitor the integration of environmental safeguards into the plantation operation, evaluate benefits to local communities, and resolve issues/conflicts

A district level task force should be established under the chairmanship of the District Administration Head, and represented by plantation managers, and village cluster heads, to monitor the progress of relevant interventions, discuss specific issues and take decisions to resolve issues that affects the natural environment and the well-being of villagers. The village cluster heads could then brief the village task forces (see R 5.3.2 for details), and carry out regular monitoring at the ground level.

5.2 Recommendations to minimize harmful impacts of plantations on biodiversity and related ecosystem services

As outlined in section 3.8 plantation projects can place much pressure on village landscapes and important biological resources. The following sections detail specific guidelines that can be adopted by Stora Enso to manage potential impacts of its plantations in Savannakhet and Salavan.

Guidelines 5.2.1: Integrate environmental safeguards as below into the proposed plantation forestry operation

(A) Sensitization of forestry workers to adopt environmental safeguards and best practice guidelines in forestry operations

- Promote awareness and education among all workers involved in forestry operations (ie., managers, supervisors, labourers including local community workers) on the need to integrate environmental safeguards into forestry operations (ie, sustenance of ecosystem services of biodiversity and related human well-being)
- Discourage staff from illegal hunting of wildlife and/or trade of wildlife
- Do not create haphazard fires that could lead to forest fires
- Promote safe use of agro-chemicals in forestry operations (including safe disposal of agro-chemical containers)
- Promote the preservation of globally threatened species and large wild trees in plantation plots
- Avoid deliberate killing of wild animals (ie., serpents etc.) during plantation operations

(B) Guidelines for selection of suitable sites for establishment of plantation forest plots:

- Select only the fallow lands that are less than 10 years old (Justification: fallow areas older than 10 years are in the secondary forest successional stage, harbouring a high species richness of plants and animals)
- Avoid areas with slopes greater than 25 degrees, and hill tops (Justification: prevent landslides and soil erosion)
- Avoid areas frequented by wild animals to access water (ie., waterholes) and also their seasonal migratory pathways such as elephant corridors (Justification: avoid wildlife conflicts)
- Avoid areas with a thin soil layer above bedrock (Justification: avoid soil erosion)

(C) Guidelines for land clearing phase

- Conduct a rapid botanical inventory of the areas identified for clearing and subsequent plantation (using parallel line transect walks), in order to:
 - Document the presence of any of the 21 globally threatened plant species occurring in Laos (see annex 5 for list of globally threatened plant species in Laos).
 - Collect seed/propagation material of important plants (ie., globally threatened plants; plants utilized by local communities etc.)
 - Mark the tree species above 50cm gbh⁴ (girth at breast height), for preservation in the plantation plot
- Promote the rescue and translocation of less-mobile wild animals (ie., fledgling birds, new-born mammals, turtles, lizards etc.) inhabiting plots earmarked for clearing, into surrounding wild habitats
- Establish nurseries of globally threatened plant species and other plant species utilized by local communities, to be used in the restoration of degraded forests, as well as to introduce such species into plantation plots.
- Establish fire belts (at least 10m wide) between cleared patches and existing forests, prior to carrying out burning of fields
- Avoid clearing of land and soil preparation during rainy seasons
- Avoid deep ploughing of soil (> 30cm in depth) for agricultural crops
- Maintain buffer zones in relevant areas (see Table 5.1 below)

⁴ Preserving indigenous tree species above 50cm gbh will function as ‘nurse vegetation’ that would provide shade for the Eucalyptus to establish well initially.

Table 5.1: Guidelines for buffer zones

Land-use/Habitat Types	Buffer zone (meters)	Justification
National Protected Areas	200-500*	Minimize human-wildlife conflicts; minimize the spread of potential fires into natural forest
Village Spirit Forests	10	Preserve cultural significance
Historical sites/monuments	50	Preserve cultural/historical significance; Tourism potential
Perennial rivers and streams	100	Minimize soil erosion, siltation, and agricultural run-off, provide micro-habitats for wildlife
Annual streams, ponds	10	Minimize soil erosion, siltation, and agricultural run-off
Village (homesteads)	>200m	Avoid damage to plantation from domestic animals; avoid damage to houses/homesteads during timber extraction

*Buffer zones of 100-500 meters are recommended, as listed under the legal terminology section, Article 3 of the Forestry Law 2007.

- Preserve natural vegetation in the plantation plot, as habitat mosaics
 - All efforts should be made to maintain indigenous trees (>50cm gbh) within a specific plantation plot, as scattered individual trees, as well as small islands of wild tree cover (see Figure 5.1.below). This will facilitate the sustenance of biodiversity within the plantation plot, and also contribute towards enhancement of soil nutrients.

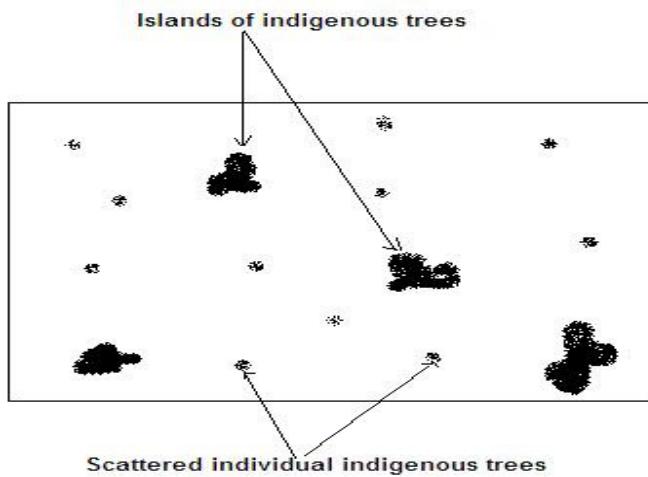


Figure 5.1: A schematic diagram of a mosaic plantation plot

(D) Guidelines for maintenance of agro-forestry operations

- Promote integrated pest management methods, and regulate the use of chemical pesticides

- Chemical fertilizers and pesticides should only be applied during the dry season, in order to minimize run-off
- Promote the use of organic fertilizers in agricultural crops. The organic fertilizer could be produced in the villages, using animal waste, house-hold waste, crop residues and nitrogen fixing weeds.
- Promote the plantation of native plant species used by local communities in selected plots (ie., leafy vegetables, medicinal plants, rattans, palms, tubers and yams etc.)
- Manage the spread of invasive alien species
 - Several species of invasive alien plants (ie., Lantana, Siam weed etc.) could establish in the plantation plots, and cause problems to crops. These need to be managed on a regular basis.
- Establishment of electric fences around plantation plots could be considered as an option, in areas where frequent damage from wild animals and/or free-roaming domestic animals (cattle, goats, buffalo etc.) is envisaged. Such electric fences could be established using solar panels and DC batteries, to provide a non-lethal shock to animals that attempt to enter plantation plots. However, local communities should be trained to maintain such electric fences.

(E) Off-site biodiversity conservation activities

- Development of home gardens as pilot initiatives
 - There is tremendous potential to establish rich home gardens in villages, with multiple use species, such as timber, fruits, tubers and yams etc.
- Restoration of degraded primary forests
 - The degraded primary forests adjoining villages (ie., production forests) could be restored in a scientific manner, using plant species propagated in nurseries managed by the plantation company (ie., threatened woody plants and others used by local communities).

Monitoring 5.2.2: Implement indicators and tools for monitoring of environmental safeguards and biodiversity in forestry plots

The following indicators would enable to evaluate the status of the incorporation of relevant environmental safeguards into forestry operations, as well as to monitor the impacts on biodiversity related to the plantation operations:

(A) Establishment of baseline indicators for monitoring, during pre-clearance phase (to be documented before clearing a selected area for plantation)

Indicators	Monitoring technique
Soil erosion	Measure sediment levels of streams and rivers that adjoin selected areas for establishment of plantation (collect random water samples from 5-10 localities and measure sediment levels using a portable equipment)
Water quality	Measure pH, salinity, conductivity, nitrates, phosphates, DO, BOD and COD of water in streams/rivers that adjoin selected areas for

	establishment of plantation (collect random water samples from 5-10 localities and measure the above physico-chemical parameters using a portable equipment)
Existing land-use around areas selected for plantation	Prepare GIS maps of existing land-use in areas selected for plantation plots and relevant villages (covering at least a 5km radius around a selected plot/village); calculate the % cover of primary forest, homesteads, fallow lands at different time intervals, production forest, irrigated paddy fields, streams and rivers etc.)
Status of crop damage by wildlife	Annual crop losses due to wildlife damage, obtained from villagers (through a socio-economic survey)

(B) Monitoring indicators for land clearing phase (to be documented within the first 2-3 months of forestry operations, preferably prior to establishment of plantation seedlings)

Indicators	Monitoring technique
Number of native tree species (>50cm GBH) ⁵ preserved in site cleared for plantation	Count the number of trees and their GBH in each plot cleared (each preserved tree could be plotted in a 10m x 10m grid map of the plantation plot); photographs of globally threatened/and or useful plant species preserved in each plot
Percentage (%) of natural vegetation patches in a single area cleared for plantation	GIS techniques (obtain GPS points of the entire plantation plot; prepare a 10m x 10m grid map; and then plot the forest patches preserved within the plot; calculate the % of natural vegetation)
Species and number of less mobile wild animals rescued and translocated into wild habitats for a single plantation plot	Information maintained by site manager, through inputs from plantation workers/labourers (and photographs of such animals)
Accidental mortality of wild animals (Species and numbers of amphibians, reptiles, birds and mammals killed due to land clearing related accidents)	Direct field observations through line transect walks across cleared plot, immediately after clearing operations (and photographs of such animals)
Rescue of seed and/or propagation material of rare and /or useful plants	Native plant nurseries established (number of species and their individual saplings in each nursery)
Fire belts established	The details (ie., measurements etc.) of fire belts established around plots (supplemented with photographs)
Evidence of illegal tree felling and hunting	Reliable information from local communities; direct observations in natural forests bordering plantation plots
Buffer zones maintained	Distance of buffer zones (m) from specific habitat/land-use types

(C) Monitoring indicators for plantation maintenance phase (initiate after a year of establishing the plantation seedlings, and repeat annually)

⁵ The different species of native tree (“above 50cm gbh) and their individual numbers preserved within a plantation plot is a good indicator of environmental safeguards adopted during the land clearing phase (especially to highlight measures to reduce impacts on indigenous biodiversity).

Indicators	Monitoring technique
Production of useful native vegetation in plantation plots	Measure the annual yield of useful native plant species grown in plantation plots
Survival of natural vegetation preserved in plantation plots	Monitor the occurrence of native trees preserved in each plot, against baseline information established during land clearance phase; document the % of natural vegetation plots in each plantation area, against the baseline information established during land clearance phase;
Status of land use around plantation plots (new areas of primary forest cleared for shifting cultivations etc.)	Observations on primary forests cleared by villagers after the establishment of plantation forests; document the area of forests cleared using the baseline land-use maps prepared during pre-clearance phase
Evidence of tree felling, illegal hunting of wildlife and trade	Reliable information from local communities; direct observations along roadsides (ie., logs ready for transport; people displaying wildlife along roads)
Species richness of birds within plantation plot	The number of different species of birds and their abundance in each plot (recorded through transect walks during morning and evening); species of birds nesting within plantation plots
Introduction and spread of invasive alien plant species	Document the presence of invasive alien plant species (ie., <i>Lantana camara</i> , <i>Eupatorium odoratum</i> , <i>Mikania micrantha</i>) within and adjoining plantation plots, through transect walks
Soil conservation methods adopted	Different soil conservation techniques practiced in a single plot (ie., levees, terraces etc.) (obtain photographs)
Status of soil erosion	Measure sediment levels of streams and rivers that adjoin selected areas for establishment of plantation (collect random water samples from the same localities where baseline measurements were made during pre-clearance phase and measure sediment levels using a portable equipment; compare values with baseline information)
Water quality of streams and rivers adjoining plantation plots	Measure pH, salinity, conductivity, nitrates, phosphates, DO, BOD and COD of water in streams/rivers that adjoin selected areas for establishment of plantation (collect random water samples from the same localities where baseline measurements were made during pre-clearance phase and measure the above physico-chemical parameters using a portable equipment; compare values with baseline information)
Status of integrated pest management and organic farming	Annual amount of chemical fertilizers and biocides used in each plantation plot; amount of organic fertilizer used in each plantation plots (per ha use)
Status of crop damage by wildlife	Annual crop losses due to wildlife damage, within plantation, and also in village farmland

	(information obtained from villagers through a socio-economic survey)
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(D) Monitoring indicators for off-site biodiversity conservation initiatives

Indicators	Monitoring technique
Status and production of home gardens established	Measure the annual yield of useful plant products from home gardens; Document the species richness of plants in home garden plots;
Status of degraded forests restored	Survival and growth of introduced seedlings; the variety and yield of NTFP's harvested from restored forests; availability of water in annual and perennial streams adjoining/below the restored forests; occurrence of wildlife in restored forests

5.3 Recommendations for further socio-economic analysis

Incorporation of in-depth socio-economic research and analysis into planning, implementation and monitoring of development interventions is critical. Chamberlain, a local expert in poverty and ethnicity, has recommended (pers. comm.) that survey-type work on ethnic minority groups should be in-depth, rather than quick surveys. Participatory observation and research should be carried out in a smaller number of villages, in order to understand the nuances of persistence and change in these societies. Participatory processes associated with project decision-making should be couched in recognition of cultural diversity, and should be conducted with high degree of transparency. This includes budgeting for the time and resources to ensure that understanding is created, through interactions in a number of local languages.

R5.3.1 - Commission in-depth anthropological work in a smaller number of villages in order to better understand persistence and change in the livelihoods, cultural life and natural resources management of these local societies. This information can be used to inform better impact mitigation for the plantation project.

Without detailed ethnographic studies documenting the full range of socio-cultural and economic systems of local ethnic groups, there is a need to move slowly. Monitoring of impacts on local communities is difficult because there is no reliable baseline upon which changes can be understood and assessed. Indicators of local development should reflect community well-being, and not just income. For Mon-Khmer groups, well-being should include recognition of the natural-human-spiritual relationships that define their world. One danger is that in the absence of nuanced information on Mon-Khmer livelihoods the assumptions underpinning the Lao-Tai worldview are juxtaposed onto other groups. Even within the Lao-Tai group, Phou Thay communities should be understood within their own unique socio-cultural context. There is a tendency to lump all "Lao Loum" into the same category and assume one set of static practices, knowledge and belief systems. Understanding the upland-lowland relationship is another key element of assessing the potential impacts of a large-scale project on this area.

R5.3.2 - The project should invest in establishing a baseline and monitoring approach that allows disaggregated analysis for different ethnicities and within communities, so that social and economic equity is achieved.

The baseline should include not only indicators of household-level economic situation but also indicators of change in traditional livelihood systems, community cohesion, and cultural change. To do this, the project should support in-depth anthropological studies of the communities involved in the

project, consisting of international and Lao social scientists. Adaptation strategies provide vital insight into how communities respond to external stimuli and deal with shocks to their systems, but are not well understood for the vast majority of the local groups, particularly Mon-Khmer groups.

R5.3.3 - Commission independent studies on food security that go beyond rice availability to look at access to foods that provide necessary components of balanced nutrition.

The food security situation should be examined in more detail, with a focus on understanding the contributions of wild food sources and managed agrobiodiversity. Villagers clearly have coping mechanisms during time of food insecurity, including collection and processing of some NTFPs, but a more thorough investigation should be made to ensure that any plantation development would not upset the very delicate balance of food security, which many communities are already finding difficulty in maintaining. An in-depth study of household economics would provide a vital view on the composition of livelihoods, including scenarios to see how different types of interventions could impact livelihoods, particularly food security. Availability of natural sources and *real* access (not just the assumption that cash income means improved food security) should be conducted. Valuation studies, focusing on benefits and costs related to current land use and under the proposed forest plantation model should be carried out in a systematic manner.

R5.3.4 - Commission independent studies on the role of livestock in local livelihoods and how livestock can work within the plantation model

The paradox of declining livestock herds despite the importance of livestock as a safety-net in poor households signals problems in the adaptive capacity of local groups in the face of external pressures. The potential conflict between land for grazing in the forest fallow mosaic and the conversion of fallow land into plantation should be a high priority area of investigation and monitoring. It would also be worthwhile to document the frequent livestock diseases in certain areas, and prescribe suitable treatment options that could be adopted by villagers, in the event of future disease outbreaks among livestock.

5.4 Recommendations for linking Stora Enso biodiversity management response to other biodiversity programmes in the area

The management of biodiversity in Laos is still seriously weak and under resourced. As already mentioned above, the Stora Enso plantation project, with its commitment to environmental and social responsibility has the potential to be an example of best practice and a driver of awareness, commitment, capacity and resources for biodiversity management. The following section provides recommendations on how the company might link its biodiversity management response to other biodiversity programmes in the area. These should be seen as initial recommendations as further studies to understand the actual delivery of biodiversity interventions by both government and local communities are required.

R5.4.1 - Preparatory phase studies related to bio-physical, socio-economic, ethno-cultural situation are conducted before the implementation of any further plantations.

- *Collaborative land use mapping at district level* - Land use mapping is a vital tool to inform management of the projects impacts on biological resources in and around the village settlements. Burapha has already initiated extensive land use mapping in Nong district collaborating with the National Land Management Authority, provincial and district agencies and the communities in village level satellite mapping. There is an opportunity here for the company to further engage these stakeholders in the area of land use mapping and help build capacity and the government land extension services across each district.

- *Independent land use and land title studies* - In addition to expanding government-company collaboration, current land use mapping techniques can also be strengthened with the commissioning of further land use studies. There is need to conduct more in depth studies of land holdings in the area to understand how farmers deal with limited access to land. Collaborative research efforts between national and international research institutions is recommended
- *A feasibility study should be undertaken to examine the possibilities of forest restoration*, including fallow regenerating areas, secondary forests and other forest types. This result will be a good potential for both plantation investor and government authority to maintain their different forest types for their long-term and sustainable use, especially NTFPs, primarily bamboo shoots and traditional medicinal herbs. For example, the project could engage with the Forest Research Center at the National Agriculture and Forestry Research Institute on forest restoration activities.

R5.4.2 - Agricultural extension program at both district and provincial levels should be strengthened for large scale plantation with the aim at improving local livelihood systems together with the provision of extension service as human resource development including:

- Support to research and capacity building in local agriculture and forestry extension officers to improve local government capacity to promote efficient agricultural and livestock management practices, assess biodiversity and to predict ecological impacts of various plantation interventions. This could include training of villagers, government staff at different levels, and private sector employees concerning knowledge and skills needed to achieve the goal of large scale plantation (see section 5.1). There is also the opportunity to establishment a plantation network for sharing their concerns experiences, and lessons learnt in the district.
- Explore and nurture a *benefit-sharing model for plantation establishment* with villagers should to gain full local participation. As mentioned above, villagers and local government officials were concerned that local stakeholders would not have a role in establishing the benefit sharing agreements. They expressed hope that local stakeholders would be involved in a rolling process to monitor and adjust benefit sharing arrangements in response to actual implementation experiences and outcomes. In their words,
- Work with and support district agricultural extension services to provide villagers with technical assistance on:
 - rice varieties; proper timing for rice seeding; and improvement of soil fertility in their swidden agriculture is essential for increasing their rice production.
 - building livestock numbers and encourage people to keep cattle in the plots. Similarly, it is recommended for villagers to learn on keeping cattle rotated in specified grazing areas, especially for large scale intercropping tree plantation

Management R5.4.3: Work with individual communities to integrate plantations into village traditional management practices and support biodiversity conservation interventions at the village level

Plantation establishment should be carried out in an integrated landscape fashion considering existing local livelihood systems and traditional management practices. The plantation model should identify and incorporate knowledge of the provisioning, supporting regulating and cultural services of these landscapes. Specific collaborative interventions include:

- Promoting community mobilization, empowerment and local governance mechanisms to conserve biodiversity for human well-being.

- A task force led by the village cluster head could be established to monitor the biodiversity in surrounding areas, and liaise with the plantation company and relevant district government authorities to address conservation issues that affects the well-being of villagers. This task force could also manage and regulate sustainable extraction and trade of biological resources harvested from forests, in order to ensure equitable sharing of profits/benefits by all households.
- A community biodiversity registry could be maintained by the cluster heads, to record relevant information gathered through villagers.
- Maintaining or creating structurally diverse ecosystems around plantations to contribute to landscape and community level biodiversity.
 - Retaining and enhancing sufficient forestlands - Spirit forest and old growth forests serve as important ecological anchors in each village. Any development activities should ensure that the functions of these forests are strengthened ensure that wild foods continue to be available
 - Support local communities in managing the biodiversity in mountain forests and rolling terrains around village settlements such as Phou Riroy, Phou Kayiane, Phou Tamoung, Phou Kaleui, Phou Amai Phou Asao, Phou Krang, Phou Nang Maan, Phou Takroy and other Nohns (Nohn Voek, Nohn Ayouk and Nohn Atreng).
- Developing livelihood alternatives - Institutional strengthening at both the village and district levels for general administration and developing livelihood alternatives.
 - Assisting local communities to maintain natural stocks of key traded NTFPs such as bong trees for bark collection, kinat resine extracted from roots of Mai Chouang, and bamboo for dry bamboos processing. At the same time, support the domestication of these viable species in their young fallows and plantations for income for generations.
 - The potential to promote aquaculture in village ponds should be explored, as the cultured fish would be a valuable source of protein for villagers.

Management R5.4.4: Support to government led biodiversity conservation activities in the 5 districts of 2 provinces that are being implemented by the government, research institutions, international organizations and international and local NGOs.

The assessment team has identified a number of opportunities to build the capacity of local institutions and support the conservation of critical habitats and species in the study area. Stora Enso could provide support to:

- National protected area management in Phou Xang He, Dong Phouvieng and Xe Sap
 - Establish a biodiversity management fund to be derived from local or global profits and channeled into the governments protected area system.
 - Support the Department of Forestry's review of the national protected area network
- Protection of the natural pine forest found in village landscapes near Xe Sap NPAs. These forests are a shared resource and therefore require collaborative protection and management. Stora Enso has the opportunity to work with villages in the area on the protection of this unique and important species. .
- Training courses and capacity building activities in cooperation with local environmental protection and forestry authorities

- Watershed and Wetlands Management - These two provinces are rich in water resources and the aquatic resources these waterways provide are an extremely important part of peoples daily diet. It is recommended that opportunities for technical assistance in setting up fish conservation zones, fish breeding and the establishment of agreements for managing their stream with neighboured villages be explored. By restoring streams and rivers through regenerating natural forest buffers, this could prove important for drinking water supply as well.
- District biodiversity monitoring - Monitoring is very limited and mainly confined to national protected areas and production forests. There is considerable scope for supporting the establishment of district biodiversity monitoring programmes, initially through the collaborative monitoring of biodiversity in and around plantation sites (see section 5.). District monitoring programmes should focus on a few easy to monitor, sensitive indicator species. For example, monitoring of change in the high value forests and downstream from plantation sites as the impacts of management practices on downstream water quality. .
- Conduct awareness raising and education programmes on ecosystem services and human-wellbeing related to biodiversity and the importance of its conservation - The company could prepare relevant communication material ihn local language (ie,m posters, pamphlets etc.), and distribute them among local government officials, plantation workers, villagers and school students in the district.

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Annex 1: Secondary Data Source – Maps

1. Burapha (Stora Enso)

Maps provided by the company include:

- Nong district satellite map
- Village satellite land-use maps (only 2 villages sources – Ban Tamluang and Ban Sang in Nong district)
- Initial feasibility mapping in areas of interest for Nong and Taoy Districts in GIS shape file format including:
 - Housing
 - Nursery sites
 - Potential plantation sites
 - Surveyed plantation sites
 - Land use
 - Permanent agriculture
 - Production forests
 - Spirit Forests
 - Conservation Forests
 - Rivers
 - Village boundaries

2. National Geographic Department

GIS shape files sourced for all districts in the study area:

- Administrative Boundaries
- Roads
- Hydrology
- Topography
- Elevation
- Village points (conducted 2003)
- Land-use (conducted 2003)
- Protected Areas
- Production Forests
- Urban areas

Annex 2: A Rapid & Participatory Assessment Methodology

The Rapid Participatory Biodiversity Assessment methodology used enabled assessment teams to gather key information on biodiversity and related ecosystem services in the study area and ground truth these findings through a series of field missions in selected landscapes surrounding local community settlements. The RPBA methodology's main advantage lies in its straightforward approach to gathering scientific information on natural resource used by local communities, through their active engagement in the process.

1. Scoping and Secondary Data Gathering

RPBAs draw substantially on secondary information. This information was gathered and analysed for key issue areas and information gaps. This analysis then informed the focus of the assessment field missions which sought to test and ground truth these initial findings. Data gathering during the scoping stages involved:

Initial scoping interviews

In preparation for the field reconnaissance mission, IUCN carried out a pre departure consultation exercise in Vientiane involving a mixture of email exchanges, phone conversations and face to face meetings with the following stakeholders

1. Mr. Bounkong Souvimonh Coordinator, Agrobiodiversity Project, National Agriculture and Forestry Research Institute
2. Mr. Hongthong Sirivath, Project Coordinator, Village Focus International Laos
3. Mr. John Dingley, Senior Technical Adviser, UXO Lao
4. Mr. Patrick Brandelard, Belgian Project Coordinator, Lao-Belgian Village Development Programme
5. Mr. Phillip Miller, Country Director, Concern Worldwide
6. Mr. Richard Jackson, Manager, Social and Community Relations-Asia, Oxiana/LXML (Vientiane HQ)
7. Mr. Rob Kelly, Manager, Village Focus International Laos
8. Mr. Rob Solomon, Project Director, World Concern Lao PDR, Salavan
9. Mr. Roger Mallot, World Wide Fund for Nature. Laos
10. Mr. Serge Verniau, Representative, United Nations Food and Agriculture Organization in Laos
11. Mr. Somsanouk Phommakhot, Department of Environment, Water Resources and Environment Agency
12. Mr. Troy Hansel, Wildlife Conservation Society, Laos
13. Mr. Vongxay, Sustainable Forestry and Rural Development project
14. Ms. Bernadette Wardle, Environment Manager, Oxiana/LXML (Vientiane HQ)
15. Ms. Mr. Phetsamay Douangmalalay, Project Officer, Village Focus International Laos
16. Ms. Tu Anh Vu, Agriculture Biodiversity Officer, United Nations Food and Agriculture Organization in Laos

These discussions provided an opportunity to briefly explain the current IUCN assessment; they also yielded important information on the project area including:

- Information on organisations working in the assessment area
- Secondary information on the biodiversity and the socio-economic situation in or around the assessment area
- Other important stakeholders to contact

These exchanges continued on the side of the official stakeholder forums held in Salavan and Sepon.

Field Stakeholder Meetings

Two stakeholder meetings were held, one each in Salavan and Savannakhet provinces. The purpose of these meetings was to brief participants on the plantation project, explain IUCN's role in carrying out a rapid and participatory biodiversity assessment in the relevant provincial districts, and generate support from government officials for the assessments, especially through provision of secondary information to IUCN. The meetings were also intended to understand the views and concerns of provincial and district officials regarding the plantation project.

The reconnaissance mission also enabled to plan out and finalize the survey methodology to gather relevant information on biodiversity, within the limited time and financial constraints, and also finalize the survey schedule.

2. Field Assessment

To ensure a representative and integrated social/biodiversity approach, the field methodology placed an emphasis on fewer but more detailed and in-depth engagements with local villages. The following process was adopted for the two field missions in Savannakhet and Salavan:

Village selection

The overall scale for this assessment is set at the district level and as such the selection of field sites/villages was done using a representative landscape and ethnicity approach identifying:

- Key land-uses and ecosystems in the district
- Ethnicity of villages in the district
- Land suitability identified by Burapha (if completed)
- Feasibility of access to the village at the time of assessment

A pre-mission team representative was sent to the provincial and district offices 3 days ahead of the main assessment teams, to carry out the following preparatory tasks:

- Ensuring that all the appropriate paper work for the field assessment was completed;
- Identifying appropriate provincial and district staff to accompany assessment teams
- Completing initial village selection based on the above criteria.

Assembly of the assessment team

The assessment was lead by an experienced multi-disciplinary team consisting of a mix of international and local biologists, social specialists, foresters and assessment managers.

Name	Designation & Affiliation	Project Role
Dr Nathan Badenoch	Programme Coordinator IUCN Lao PDR	Project Team Leader
Mme Latsamay Sylavong	Country Representative, IUCN Lao PDR	Social and Forestry Specialist
Dr Channa Bambaradeniya	Coordinator - Regional Species Conservation Programme, IUCN Asia	Lead Biologist
Mr Tom Callander	Programme Officer, IUCN Lao PDR	Project Coordinator
Mr Xiong Tsechalicha	Senior Programme Officer, IUCN Lao PDR	NRM and EIA specialist
Mr. Chay Noy Sisomphane	Department of Forestry - Division of Forest Resource Conservation(DFRC), MAF	Field specialist: Biodiversity Assessment
Mr. Bounhom Thepphavong	Land Use Planning and Development Department Land Conservation	Field Specialist: Forester

	Management Division, LMNA	
Mr. Daokham		GIS
Mr. Bounxoth Vongvilayvone	Faculty of Social Sciences, NUoL	Field Specialist: Anthropologist
Mr. Khamphone Sengdala	NTFP Research Section, Forestry Research Center, NAFRI,	Field Specialist: NTFP

From this mix, field assessment teams were assembled, each with a similar mix of specialists and skill sets. Where one team was lacking specific expertise (eg, the absence of a qualified NTFP expert), this gap was filled by selecting appropriate local government representatives or by using methods to ensure that data is was collected and then assessed by relevant specialist at a later date (ie, taking photos or collecting specimens of NTFPS for identification at a later stage).

Each team was accompanied by:

- 1 provincial government representative
- Between 2 and 3 district government representative
- Community members (or key informants) and an assistant to the key informant group who could help with language translation

Village consultation and transect observations

In order to test previously gathered information and to source new primary information each team carried out the following steps in the selected villages:

- *Village Focal Group Meetings* were held with the village headman and selected village representatives including village elders, workers, women and youth. Meetings consisted of semi structured discussions and a village mapping exercise to gather socio-economic data and information about biodiversity and village landscapes. Species lists and identification charts were used in some instances although not by all teams.
- *Transect walks* based on information gathered through the initial discussion and mapping exercise, were organised with men and women with good knowledge of the village landscape. Before setting out the team and local representatives chose routes that best covered representative village habitats (village, fallow land, sacred forests etc). During the walks, discussions with villagers continued. At random points along the transect the team stopped at specific points to record:
 - Description of habitat
 - Plant observation and identification⁶
 - Stories about the area (previous uses, events, areas of cultural/spiritual significance etc)
- *A village debrief* was conducted at the completion of the transect walk to discuss and clarify any outstanding questions or issues about the village. At this point assessment team leaders conducted discussions on the proposed plantation to source villages' initial concerns and expectations of such developments.

Data compilation and analysis

Information collected from the initial scoping consultations, secondary review and the main field missions was then consolidated and analysed.

⁶ In fallow and village use forest some teams conducted 3m x 3m (fallow) and 5m x 5m (village use forest) plot assessments counting number of species and recording info on their size etc. General observation of abundance using a measuring system from 1 -5 (5 being very abundant) can also be used at other times.

- *Village Information Sheets* – Each evening during the 2 field missions, assessment teams discussed the information they had gathered that day and compiled short summaries of each village. This included: basic description of the village; key problems faced by the village; basic wealth and income statistics; landscape and land-overview; use of biodiversity in the village; status and trends of biodiversity in the village and general threats and a discussion about the management of this biodiversity. These sheets provided important insights into each village and when combined a strong snapshot of the landscapes and people in each district – see *Field Examples* in section 2 of the main report.
- *Landscapes and Livelihood assessments* – using the Millennium Assessment's ecosystem services chart as a base, representative landscapes and the provision of ecosystem services were then analysed for each district. A summary of the key findings of this analysis is presented in section 3.6
- *Species list consolidation* – important secondary species data was consolidated with the species information gathered on the two field missions. This information can be viewed in annexes 3 and 4. These lists will be an important input into future biodiversity assessment, monitoring and management.
- *Mapping and GPS* – Mapping information from government agencies (the National Geographic Department, Department of Forestry and the National Agriculture and Forestry Research Institute), from Burapha and GIS points from the IUCN assessment teams were then mapped together. The results provided vital inputs into landscape analysis and in the case of Nong and Taoy, analysis of the company's feasibility mapping with the information that the assessment teams had collected at the village level.
- *Photos* – A selection of photos from each village was collated to support the overall analysis.

3. Final Stakeholder Consultations

A final stakeholder consultation meeting will be held in Savannakhet to share the results of this biodiversity assessment with government and community representatives.

4. Methodology Limitations

The RPBA methodology allowed assessment teams to cover a large area in a very short time period and to make informed judgements about the use, state, trends and threats to biodiversity in the study area. The RPBA by its very nature does not allow for a comprehensive scientific study of the intricacies of biodiversity and its importance to people in the study area.

In addition to this overarching limitation, the following constraints and limitations that may have impacted data gathering should be noted:

- Weather and road conditions limited district representation at the Salavan stakeholders meeting.
- The Savannakhet stakeholder meeting was held in Sepon to make it most accessible for district officials and local stakeholders. As a result, representation from the provincial level was minimal – especially from the civil society working in the area.
- Information on the assessment area is limited and dispersed across a number of organisations. Remoteness, of the area seems to be a critical factor in the limited information available especially in hard to reach places such as Samoi where access by road in Lao is limited to the dry season months.

- There were some problems with official communications within the Savannakhet Agriculture and Forestry administrative hierarchy, causing difficulty in making official contact with some villages.
- Recent village consolidations in Sepon district meant that basic demographic and socio-economic data in many villages was incomplete, outdated or completely lacking.
- Language proved difficult in some villages where locals did not speak Lao well. This impacted particularly on the results of species identification – some species were only identified in the local language. For scientific quality reasons, this information could not be used in the final species analysis.
- The rapid nature of the survey meant that women's participation in the focus groups was not as high as hoped, although the team found that transect walks are an excellent way of providing voice to women.
- The villagers tended to withhold information on exploitation of animal species, in the presence of government officials
- Some of the information provided by villagers seemed to be contradictory, and time was a constraint in verifying such information.

Annex 3: Primary Species Lists

Annex 3.1 Nong

Mammals recorded in Nong District – Savannakhet Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland; PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	Observed/ Interview	Habitat	Koun Si	Loe	Along	Poun Nyang	Poun Tong	Sang-Jeng	Tam lung	Houb
Elephantidae	Asian Elephant - <i>Elephas maximus</i>	ຊ້າງ	i	DPF, DSF					+			
Bovidae	Wild Water Buffalo - <i>Bubalus arnee</i>	ຄວາຍປ່າ	i	DPF, DSF					+			
Bovidae	Gaur - <i>Bos gaurus</i>	ເມີຍ - ກະທົງ	i	DPF, DSF					+			
Ursidae	Sunbear - <i>Ursus malayanus</i>	ເໝືອຍ	i	DPF, DSF					+			
Ursidae	Asiatic Black Bear - <i>Ursus thibetanus</i>	ໝີຄວາຍ (ໝີດຳ)	i	DPF, DSF					+			
Felidae	Tiger - <i>Panthera tigris</i>	ເສືອໂຄ່ງ	i	DPF, DSF					+	+		+
Cercopithecidae	Douc Langur - <i>Pygathrix nemaeus</i>	ຂາແດງ	1,0	DPF, DSF				+	+	+		
Hylobatidae	Gibbon Species - <i>Hylobates leucogenys/gabrielae</i> sp.	ກະນີ	i	DPF, DSF					+			
Cervidae	Sambar Deer - <i>Cervus unicolor</i>	ກວາງ	i	DSF,FA	+				+	+		+
Pteromyidae	Giant Flying Squirrel - <i>Ratufa bicola</i>	ປ່າງລິ້ວ	i	DSF,FA	+				+	+		+
Mustelidae	Otter - <i>Lutra sp.</i>	ນາກນ້ຳ	i	RB,Xelanong,XeLou	+		+	+	+			

Manidae	Pangolin - <i>Manis javanicus</i>	ລິ້ນ	i	DPF, DSF					+	+		+
Loridae	Slow Loris Species - <i>Nycticebus sp.</i>	ລົງລົມ	i	DPF, DSF			+		+	+	+	+
Canidae	Golden Jackal - <i>Canis aureus</i>	ໝາຈອກ	i	DPF, DSF								+
Viverridae	Large Spotted Civet - <i>Viverra megaspila</i>	ເຫງິນຫາງກ່ານ	i	DSF,FA		+	+	+	+			+
Viverridae	- <i>Paradoxurus sp.</i>	ເຫງິນອີ້ມ	i	DSF,FA		+		+	+	+		+
Cervidae	Red Muntjac - <i>Muntiacus muntjac</i>	ຟານເລົ່າ	i	DSF,FA		+	+	+	+	+	+	+
Tragulidae	Lesser Mouse Deer - <i>Tragulus javanicus</i>	ໄກ້	i	DSF,FA		+				+	+	+
Mustelidae	Hog-Nosed Badger - <i>Arctonyx collaris</i>	ໝູ່ລິ້ງ	i	DPF, DSF					+			
Hystricidae	Brush -tailed Porcupine - <i>Atherurus macrourus</i>	ຫອນ	i	DPF, DSF						+		+
Hystricidae	Porcupine - <i>Hystrix brachyura</i>	ເໝັ່ນ	i	DPF, DSF						+		+
Cercopithecidae	Monkeys - <i>Macaca sp.</i>	ລົງ	i	DPF, DSF			+				+	+
Sciuridae	Black Giant Squirrel - <i>Ratufa bicolor</i>	ກະຮອກໝີ່	i	DSF,FA							+	+
Spalacidae	Large Bamboo Rat - <i>Rhizomys sumatrensis</i>	ອິ້ນ ໃຫຍ່	i	DSF,FA						+	+	+
Suidae	Wild Pig - <i>Sus scrofa</i>	ໝູ່ປ່າ	l,o	DSF,FA		+	+	+	+	+	+	+
Sciuridae	Irrawaddy Squirrel - <i>Callosciurus pygerythrus</i>	ກະເລນ	i	DSF,FA						+	+	+
Sciuridae	Berdmore's Squirrel - <i>Menetes bermorei</i>	ກະຈ້ອນ	i	DSF,FA				+		+	+	+
Pteromyidae	Black Flying Squirrel - <i>Aeromys tephromelas</i>	ປ່າງຫຼູດຳ	i	DSF,FA		+				+	+	+

Remarks:

The mammal species recorded during the village interviews have not been confirmed but based on the villagers perceptions.

Visual aids were used to facilitate the interviews in order to help identify a species and that to make better in data gathering process across all the participating villages

Observed species included:

A skin of Douc Langur - *Pygathrix nemaeus* and a skull of Common wild pig - *Sus scrofa* were seen the head of village's house in Ban Poun Nyang (photo).

Birds recorded in Nong District - Savannakhet Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland; PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	Observed/Interview	Habitat	Koun Si	Loe	Along	Poun Nyang	Poun Tong	SangJ ean	Tam-lung	Houb
Phasianidae	Green Peafowl - <i>Pavo muticus</i>	Nok Yong	i	DPF, DSF	+			+	+	+		
Bucerotidae	Great Hornbill - <i>Buceros bicornis</i>	ນົກ ກີກຄໍຄຳ	i	DPF, DSF	+				+			+
Phasianidae	Silver Pheasant - <i>Lophura nycthemera</i>	ໄກ່ຂວາຫຼວງ (ໄກ່ຂວາຫຼັງຂາວ)	i	DPF, DSF							+	
Phasianidae	Siamese Fireback - <i>Lophura diardi</i>	ໄກ່ຂວານົນ	i	DPF, DSF			+	+		+	+	+
Phasianidae	Grey Peacock-Pheasant - <i>Polyplectron bicalcaratum</i>	ນົກ ກາງກອດ	i	DPF, DSF							+	
Anatidae	Cotton pygmy-Goose - <i>Nettapus coromandelianus</i>	ນົກ ເປັດປ່ອງ	i	RB	+		+					
Passeridae	Asian Golden Weaver - <i>Ploceus hypoxanthus</i>	ນົກ ກະຈາບຄຳ	i	DPF, DSF,FA,	+				+	+		
Psittacidae	Red Breasted Parakeet - <i>Psittacula alexandri</i>	ນົກແຂກ	i	DPF, DSF,FA,		+			+		+	
Centropodida	Greater Coucal -	ນົກ ກິດປີດ	i	DPF, DSF,FA,						+		+

e	<i>Centropus sinensis</i>												
Bucerotidae	Oriental Pied Hornbill - <i>Anthracoceros albirostris</i>	ນົກແກງ	i	DPF, DSF,FA,	+					+			+
Sturnidae	Hill Myna - <i>Gracula religiosa</i>	ນົກສາລິກາ	i	DPF, DSF,FA,									+
Picidae	Wood-pecker - <i>Picus sp.</i>	ນົກຫົວຂວານ (ນົກສະໄລ)	i	DPF, DSF,FA,						+			+
Psittacidae	Parakeets Species - <i>Psittacula sp.</i>	ນົກແກ້ວ	i	DPF, DSF,FA,									+
Columbidae	Pale-capped Pigeon - <i>Columba punicea</i>	ນົກ ເຂົາ	i	DPF, DSF,FA,									+
Columbidae	Green Pigeons - <i>Treron sp.</i>	ນົກ ເປົ້າ	i	DPF, DSF,FA,									+
Falconidae	Changeable hawk Eagle - <i>Spizaetus cirrhatus</i>	ແຫລວມູມ	i,o	DPF, DSF,FA,				+	+				+
Ardeidae	Egrets - <i>Egretta sp.</i>	ນົກຍາງ	i,o	DPF, DSF,FA,									
Psittacidae	Parakeets - <i>Psittacula sp.</i>	ນົກ ກ່າງ	i	DPF, DSF,FA,									
Phasianidae	Red Junglefowl - <i>Gallus gallus</i>	ໄກ່ປ່າ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Corvidae	Drongo Species - <i>Dicrurus sp.</i>	ນົກແຊວ	i	DPF, DSF,FA,								+	+
Corvidae	Large-billed Crow - <i>Corvus macrohynchos</i>	ກາ	i,o	DPF, DSF,FA,							+		+

Remarks:

The birds recorded during the village interviews have not been confirmed but based on the villagers perceptions.

Observed species included:

Egrets - *Egretta sp.* and 4 Large-billed Crows seen flying over Nong river

Amphibians & Reptiles recorded in Nong District - Savannakhet Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland;

PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	Observed/ Interview	Habitat	Koun Si	Loe	Along	Poun Nyang	Poun Tong	Sang-Jeng	Tamlung	Houb
Emydidae	Elongated turtle - <i>Indotestudo elongata</i>	ເຕົ້າ ເພັກ	i	DPF, DSF							+	
Emydidae	- <i>Xenochrophis flaviunctata</i>	ເຕົ້າ ນາ	i	RB	+							
Trionychidae	Fresh water Turtle- <i>Amyda sp.</i>	ປາຝາອອງ	i	RB	+					+		
Elapidae	King cobra - <i>Ophiophagus hannah</i>	ງູຈິງອາງ	i	DPF, DSF			+	+			+	+
Boidae	Reticulated Python - <i>Python reticulates</i>	ງູເສສິອມ	i	DPF, DSF,FA			+				+	+
Elapidae	Cobra species - <i>Naja sp.</i>	ງູເຫ້າ	i	DPF, DSF,FA		+	+	+	+	+	+	+
Colubridae	- <i>Zamenis sp.</i>	ງູສິງຕິງ	i	DPF, DSF,FA,RB		+	+	+	+	+	+	
Colubridae	Radiated Ratsnake - <i>Elaphe radiata</i>	ງູສາ	i	DPF, DSF		+	+		+	+	+	
Viperidae	- <i>Trimeresurus gramineus</i>	ງູຂຽວ	o				+					
Varanidae	Bangal Monitor - <i>Varanus bengalensis</i>	ແລນ	i	DPF, DSF,RB	+	+	+		+	+		+
Varanidae	Water monitor - <i>Varanus salvator</i>	ເສ້ຍ	i	RB,DSF					+	+		
Agamidae	Water Dragon - <i>Pysignathus cocincinus</i>	ກະທ້າງ	i	RB	+	+	+	+	+	+		+
Gekkonidae	Gekko Species - <i>Gekkonidae sp.</i>	ກິບແກ້	o,i	DSF								+
Agamidae	Forest Crested Lizard - <i>Calotes emma sp.</i>	ກະປອນ	i	DSF, FA		+	+				+	+
-	Shrimp Species	ກຸ້ງ	i	RB	+	+	+	+	+	+	+	+
-	Crabs	ກະບູ	i	RB	+	+	+	+	+	+	+	+
-	Snail Species	ຫອຍ	i	RB	+	+	+	+	+	+	+	+
Bufo	Toad - <i>Kaloula medilineeata</i>	ອີງ	i	RB	+	+	+	+	+	+	+	+
Ranidae	Frog- <i>Rana limnocharis</i>	ກົບ	i	RB	+	+	+	+	+	+	+	+

Ranidae	Common Lowland Frog- <i>Rana sp.</i>	ຂງດ	i	RB	+	+	+	+	+	+	+	+
Bufo	True toads - <i>Bufo sp.</i>	ຄັນຄາກ	i	RB	+	+	+	+	+	+	+	+

Remarks:

The amphibian and reptile species recorded during the village interviews have not been confirmed but based on the villagers perceptions.

Observed species included:

Trimeresurus gramineus was found eating a frog nearly the Nong river bank.

Freshwater fish recorded in Nong District - Savannakhet Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland; PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	Observed/ Interview	Habitat	Koun Si	Loe	Along	Poun Nyang	Poun Tong	Sang- jeng	Tamlung	Houb
Bagridae	<i>Mystus microphthalmus</i>	ປາເຄິງ		RB, Xelanong	+		+	+	+			
Cyprinidae	<i>Cirrhinus molitorella</i>	ປາແກງ		Xelanong, Xe Lou	+		+	+	+			
Sisoridae	<i>Bagarius Yarrelli</i>	ປາແຂ້		Xelanong, Xe Lou	+		+	+	+			
Cyprinidae	<i>Poropuntius sp.</i>	ປາຈາດ		Xelanong, Xe Lou	+		+	+	+			
Notopteridae	<i>Chitala sp.</i>	ປາຕອງ		Xelanong, Xe Lou, Houay	+		+	+	+			
Bagridae	<i>Mystus microphthalmus</i>	ປາເຄິງ		Xelanong, Xe Lou, Houay	+		+	+	+			
Synbranchidae	<i>Monopterus albus</i>	ອ່ຽນ		Xelanong, Xe Lou, Houay		+	+	+	+			+
Clariidae	<i>Clarias macrocephalus</i>	ປາດຸກ		Xelanong, Xe Lou, Houay		+	+	+	+	+	+	+
Channidae	<i>Channa striata</i>	ປາຄໍ		Xelanong, Xe Lou, Houay		+	+	+	+	+	+	+
Cyprinidae	<i>Barbodes gonionotus</i>	ປາປາກ		Xelanong, Xe Lou, Houay	+		+	+	+			
Cyprinidae	<i>Puntioplites sp.</i>	ປາສະກາງ		Xelanong, Xe Lou, Houay	+		+	+	+			
Cyprinidae	<i>Mystacoleucus sp.</i>	ປາຫລັງເກາະ(ປາຫລັງໜາມ)		Xelanong, Xe Lou, Houay	+		+	+	+			
Labenini	<i>Morulus sp.</i>	ປາເພີຍ		Xelanong, Xe Lou, Houay	+		+	+	+			
Bagridae	<i>Hemibagrus sp.</i>	ປາກິດ		Xelanong, Xe Lou, Houay			+	+	+			
Mastacembelidae	<i>Mastacembelus favus</i>	ປາຫລາດ		Xelanong, Xe Lou, Houay			+	+	+			
Channidae	<i>Channa gachua</i>	ປາກ້ຽງ		Xelanong, Houay			+	+	+			+
Pangasidae	<i>Pangasius sp.</i>	ປາຫີວນ່ວນ										
Cyprinidae	<i>Systemus aurotaeniatus</i>	ປາຂາວ		Xelanong, Xe Lou, Houay			+	+	+			+
Cyprinidae	<i>Rasbora sp.</i>	ປາຊິວ		Xelanong, Xe Lou, Houay		+	+	+	+	+	+	+
Channidae	<i>Channa sp.</i>	ປາກ້ວນ		Xelanong, Xe Lou			+	+	+			
Siluridae	<i>Kryptoerus sp.</i>	ປາໂລໂນ່		Xelanong, Xe Lou			+	+	+			
Anabantidae	<i>Anabas testudineus</i>	ປາເຂັ້ງ		Houay						+		

Remarks:

The fish recorded during the village interviews have not been confirmed but based on villagers the perceptions.

visual aids were used for the interview as to facilitate the interviewees to identify a species and to make data gathering process across all the participating

villages.

**Plants recorded in Nong District -
Savannakhet Province**

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded
Secondary Forest; FA - Fallow Scrubland;
PF - Paddy Fields; G - Grasslands; RB -
River Bank)

Family	Common & Scientific Name	Lao Name	General Use	Life form (eg tree, shrub, herb, vine etc)	Observed/ Interview	Habitat	Koun Si	Loe	Along	Poun Nyang	Poun Tong	Sang-Jeng	Tamlung	Houb
<i>Anacardaceae</i>	<i>Spondias pinnata</i>	Mai kok	fruit edible	tree	o, i	DPF,DSF, FA	+		+	+	+	+	+	+
<i>Apocynaceae</i>	<i>Alstonia scholaris</i>	Mai tin pet	-		o, i	HG, DPF, DSF	+	+	+	+	+	+	+	+
<i>Bombacaceae</i>	<i>Bombax ceiba</i>	Mai ngieou	fruit edible	tree	o,i	HG,DPF, DSF, FA,	+	+	+	+	+	+	+	+
<i>Dipterocarpaceae</i>	<i>Anisoptera costata</i>	Mai bak	contruction	tree	o, i	DPF,DSF, FA	+	+	+	+	+	+	+	+
<i>Dipterocarpaceae</i>	<i>Hopea odorata</i>	Mai khaan	contruction		o, i	DSF, FA		+	+	+	+	+	+	+
<i>Flacourtiaceae</i>	<i>Casearia floranos</i>	Mai pao	-	small tree	o,i	DSF, FA, G	+	+	+	+	+	+	+	+
<i>Graminae</i>	<i>Bambusa blumeana</i>	Mai pai bann	shoots edible	shrub	o, i	HG,RB	+	+	+	+	+	+	+	+
<i>Graminae</i>	<i>Bambusa tulda</i>	Mai bong	shoots edible	shrub	o, i	HG, DPF, DSF, FA, RB	+	+	+	+	+	+	+	+
<i>Graminae</i>	<i>Broom grees</i>	Keam	broom grass	shrub	i	DSF, FA	+	+	+			+	+	+
<i>Graminae</i>	<i>Dendrocalamus lonoifimbriatus</i>	Mai phang	shoots edible, feed for cattle		o, i	DPF, DSF	+	+	+	+	+	+	+	+

<i>Graminae</i>	<i>Gigantochloapas</i>	Mai lai	shoots for eating and leaf for cattle	shrub	o, i	HG, DPF, DSF, FA, RB	+	+	+	+	+	+	+	+
<i>Graminae</i>	<i>Indosasa sinica</i>	Mai khom												
<i>Graminae</i>	<i>Schizostachyum blumei</i>	Mai hea	shoots for eating and leaf for cattle		o, i	HG, DPF, DSF, FA, RB	+	+	+	+	+	+	+	+
<i>Gramineae</i>	<i>Oxytenantha parviflora</i>	Mai soth	shoots for eating and leaf for cattle	shrub	o, i	HG, DPF, DSF, FA, RB	+	+	+	+	+	+	+	+
<i>Hypericaceae</i>	<i>Cratoxylum formosum</i>	Mai Tie	firewood	small tree	o, i	DSF, FA	+	+	+	+	+	+	+	+
<i>Irvingiaceae</i>	<i>Irvingia malayana</i>	Mai bok	firewood	tree	o,i	HG,DPF, DSF, FA, RB	+	+	+	+	+	+	+	+
<i>Leguminosae</i>	<i>Acacia megdalena</i>	Namkhi heth	firewood	shrub	o	DSF, FA	+	+	+			+	+	+
<i>Leguminosae</i>	<i>Azelia xylocarpa</i>	Mai teka	hard wood with high value, making flooring and ceiling of houses		o, i	DSF, FA	+	+	+	+	+	+	+	+
<i>Leguminosae</i>	<i>Dalbegia cochinchinensis</i>	Mai ka nhoung	wood with high value		o, i	HG, DPF,DSF, FA					+		+	
<i>Leguminosae</i>	<i>Peltaphorum desyrachis</i>	Mai safang	construction	tree	o, i	HG, DPF, DSF, FA, RB	+	+	+	+	+	+	+	+
<i>Leguminosae</i>	<i>Senna siamea</i>	Mai khi leck	firewood and edible leaf	small tree	o, i	HG, DSF, FA, RB	+	+	+	+	+	+	+	+
<i>Lythraceae</i>	<i>Lagestroemia blansae</i>	Mai puay	hard wood with high value, making flooring and ceiling of houses	small tree	o, i	DPF, DSF,	+	+	+	+	+	+	+	+

<i>Meliaceae</i>	<i>Azadirachta indica</i>	Mai kadao	-		o,i	DPF, DSF	+	+	+	+	+	+	+	+
<i>Meliaceae</i>	<i>Xylia xylocarpa</i>	Mai deng	hard wood with high value, making flooring and ceiling of houses		o,i	DPF, DSF,	+	+	+	+	+	+	+	+
<i>Myrtaceae</i>	<i>Syzygium cinereum</i>	Mai var	construction tree											
<i>Orchidaceae</i>	<i>Orchid spp</i>	Dok phueng	medicine	seedling	o	DSF,FA	+	+	+			+	+	+
<i>Palmae</i>	<i>Daemonoros jenkinsiana</i>	Wai boun	shoot edible	seedling	o,i	DPF, DSF, FA,	+	+	+	+	+	+	+	+
<i>Palmae</i>	<i>Rhapis laoensis</i>	Sann	shoot edible	seedling	o,i	DPF, DSF, FA,	+	+	+	+	+	+	+	+
<i>Pinaceae</i>	<i>Keteleeria evelyniana</i>	Mai hing	construction tree		o,i	DPF, DSF	+		+	+	+	+	+	+
<i>Proteacea</i>		Mon sa	leaf for insect (Mone)	tree	o,i	HG, FA	+	+	+			+	+	+
<i>Pterocarpaceae</i>	<i>Pterocarpus macrocapus</i>	Mai dou	Hard wood with high value , making flooring and ceiling of houses		o,i	DPF, DSF,	+	+	+	+	+	+	+	+
<i>Sterculiaceae</i>	<i>Helicteres viscida blume</i>	Mai khi on	animal forage	herb	o,i	DSF, FA, G	+	+	+	+	+	+	+	+
<i>Zingiberaceae</i>	<i>Alinia malaceaeesis</i>	Ka pa	eating		o,i	HG, DSF, FA,	+	+	+	+	+	+	+	+
<i>Zingiberaceae</i>	<i>Spp</i>	Mark neang	fruit edible, for export	herb	o, i	DSF, FA	+		+	+	+	+	+	+
<i>Tonnidae</i>	<i>Dalium cochinchinansis</i>	Mai kheng	firewood	tree	o,i	HG,DPF, DSF, FA,	+	+	+	+	+	+	+	+
	<i>Schima wallichii</i>	Mai mi	fruit edible, sell wood		o, i	HG	+	+	+	+	+	+	+	+
	<i>Munting calabura</i>	Mai khom	fruit edible for animals	small tree	o, i	HG, DSF, FA	+	+	+	+	+	+	+	+
<i>Palmae</i>	<i>Calamus tetradactylus</i>	Wai hang nou	eating and using	shrub	o,i	HG, DSF, FA	+	+	+	+	+	+	+	+

<i>unidentified</i>	<i>unidentified</i>	Mai gong	-		o, i	HG, DSF, FA	+	+	+	+	+	+	+
<i>unidentified</i>	<i>unidentified</i>	Mai ka leat	-		o, i	HG, DSF, FA	+	+	+	+	+	+	+
<i>unidentified</i>	<i>unidentified</i>	Mai lout lou	-		o, i	HG, DSF, FA	+	+	+	+	+	+	+
<i>unidentified</i>	<i>unidentified</i>	Khoua kang	-		o, i	HG, DSF, FA	+	+	+	+	+	+	+
<i>unidentified</i>	<i>unidentified</i>	Ouay la oung	-		o, i	HG, DSF, FA	+	+	+	+	+	+	+
<i>Smilacaceae</i>	<i>Smilax glabra</i>	Nha houa	medicine	vine	o, i	HG, DSF, FA	+	+	+	+	+	+	+
<i>unidentified</i>	<i>unidentified</i>	Kua a cho	-		o, i	HG, DSF, FA	+	+	+	+	+	+	+
<i>unidentified</i>	<i>unidentified</i>	Sa vee	-		o, i	HG, DSF, FA	+	+	+	+	+	+	+
<i>unidentified</i>	<i>unidentified</i>	Ka la ka	-		o, i	HG, DSF, FA	+	+	+	+	+	+	+
<i>unidentified</i>	<i>unidentified</i>	Lack ka voi	-		o, i	HG, DSF, FA	+	+	+	+	+	+	+
<i>Anacardaceae</i>	<i>Spondias pinnata</i>	Mai kok	fruit edible	tree	o, i	DPF, DSF, FA	+		+	+	+	+	+
<i>Apocynaceae</i>	<i>Alstonia scholaris</i>	Mai tinpet	-		o, i	HG, DPF, DSF	+	+	+	+	+	+	+

Remarks: - unidentified species in local language (Lao theung)
Annex 3.2 Sepon

Birds recorded in Sepon District - Savannaket Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland; PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common	Scientific	Lao Name	Observed/ Interview	Habitat	Houi Jaeng	Muang Janh	Muang Saen	Xepon kao	Hoai Thone	Khae Ving
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Phasianidae	Silver Pheasant	<i>Lophura nycthemera</i>	ໄກ່ຂວາຫຼວງ (ໄກ່ຂວາຫຼັງຂາວ)	Interview	DSF,FA			7	
Tytonidae	Spot-bellied Eagle Owl	<i>Bubo nipalensis</i>	ນົກເຄົ້າ (ນົກທິດທີ່ໃຫຍ່)	Interview	DSF,FA		8		9
Tytonidae	All Owls	<i>Asio, Otus, Glaucidium, Athene, Ninox, Ketupa, Strix sp.</i>	ນົກເຄົ້າ ທຸກຊະນິດ	Interview	DSF,FA	10			7
Columbidae	Pale-capped Pigeon	<i>Columba punicea</i>	ນົກເຂົາ	Interview	DSF,FA	10	8		7
Rallidae	Watercock	<i>Gallicrex cinerea</i>	ນົກຕູມ	Interview	DSF,FA				
Columbidae	All Green Pigeons	<i>Treron sp.</i>	ນົກເປົ້າ ທຸກຊະນິດ	Interview	DSF,FA	9	8		
Pittidae	Pittas	<i>Pitta sp.</i>	ນົກແຕວແລວ	Interview	DSF,FA			7	
Phasianidae	Red Junglefowl	<i>Gallus gallus</i>	ໄກ່ປ່າ	Interview	DSF,FA		9	4	8
Corvidae	Drongo Species	<i>Dicrurus sp.</i>	ນົກແຊວ	Interview	DSF,FA				
Phasianidae	Siamese Fireback	<i>Lophura diardi</i>	ໄກ່ຂວານົນ	Interview	DSF,FA			7	7
Psittacidae	Parakeets Species	<i>Psittacula sp.</i>	ນົກແກ້ວ	Interview	DSF,FA	9			4

Remarks:

The bird species recorded during the village interviews have not been confirmed from the transect walk but based on the villagers perceptions. Where number 1-10 signifies village ranking of importance of species. 1 lowest, 10 highest

Plants recorded in Sepon District - Savannaket Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland; PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	General Use	Life form (eg tree, shrub, herb, vine etc)	Observed/Interview	Habitat	Houi Jaeng	Muang Janh	Muang Saen	Xepon kao	Hoai thone	Khae Ving
<i>Anacardiaceae</i>	<i>Spondias pinnata</i>	Mai kok	Fruit edible	Tree	Observed	DSF, FA	8	8	8	8	8	8
<i>Apocynaceae</i>	<i>Wrightia arborea</i>	Mai mouk	fire wood	tree	Observed	DSF, FA	x	x	x	x	x	x
<i>Bombacaceae</i>	<i>Bombax ceiba</i>	Mai hia	fruit edible	tree	Observed	HG	8	7	8	7	7	10
<i>Dioscoreaceae</i>	<i>Dioscorea hispida</i>	Koi	hurb edible	vine	Observed	DSF, FA	x	x		x		7
<i>Dioscoreaceae</i>	<i>Casava</i>	Man toon	food	crop	Observed	DSF, FA	x	x	x		x	3
<i>Dipterocarpaceae</i>	<i>Anisoptera costata</i>	Mai bark	constuction	rree	Observed	DSF, FA	6	8	7	7	7	6
<i>Dipterocarpaceae</i>	<i>Dipterocarpus alatus</i>	Mai nhang	resin	resin	Observed	-	x	x	1	x		6
<i>Dipterocarpaceae</i>	<i>Vatica harmandii</i>	Mai si	resin	resin	Observed	-	x	x	3	x		3
<i>Euphorbiaceae</i>	<i>Phyllanthus embrica</i>	Mai kham pom	firewood and fruit edible	small tree	Observed	DSF, FA	8	7	7	8	8	10
<i>Flacourtiaceae</i>	<i>Casearia floranos</i>	Mai pao	fire wood	small tree	Observed	FA	6	7	7	5	6	6
<i>Gramineae</i>	<i>Bambosa arounidinasia</i>	Mai Phai man mou	shoot edible	shrub	Observed	DSF, FA	x		x	x	6	4
<i>Gramineae</i>	<i>Bambusa blumeana</i>	Mai Phai bann	shoot edible	shrub	Observed	DSF, FA	x	x	x	x	x	4
<i>Gramineae</i>	<i>Bambusa tulda</i>	Mai bong	shoot edible	shrub	Observed	DSF, FA	7	7	10	10	10	10

<i>Gramin Broom greesae</i>	Khaem	broom grass	herb	Observed	not recorded	7	8	8	10	8	10
<i>Gramin Dendrocalamus ae lonoifimbriatus</i>	Mai phang	shoot edible	shrub	Observed	DSF, FA	x		x	x	x	8
<i>Gramin Dendrocalamus ae membranaceus</i>	Mai sang	shoot edible	shrub	Observed	DSF, FA	x		x	x		8
<i>Gramin Gigantochlo apasae</i>	Mai lai	shoot edible	shrub	Observed	DSF, FA	7	7	10	10	10	10
<i>Gramin Phyllostochysae</i>	Mai ka sa	shoot edible	shrub	Observed	DSF, FA	x	5	10	10	x	7
<i>Gramin Schizostachyum blumeiae</i>	Mai hea	shoot edible	shrub	Observed	DSF, FA	x	x	x	x	x	7
<i>Gramin ae</i>	Lao	shoot edible	seedling	Observed	DSF, FA	x	x	6	x		4
<i>Gramin Oxytenenthra parvifloraeae</i>	Mai soot	shoot edible	shrub	Observed	DSF, FA	x		x	x	3	7
<i>Gramin Dendrocalamus Brendisii ae</i>	Mai sang pai	shoot edible	shrub	Observed	DSF, FA	x		x	x	x	5
<i>Hypericaceae Cratoxylum formosum</i>	Mai tie	firewood	small tree	Observed	FA	7	7	7	7	7	6
<i>Irvingiaceae Irvingia malayana</i>	mai bok	firewood	tree	Observed	DSF, FA	8	8	7	5	8	7
<i>Leguminosae Acacia megdalena</i>	Namkhi het	firewood	shrub	Observed	DSF, FA	6	6	6	5	6	5
<i>Leguminosae Peltaphorum desyrachis</i>	Mai sa fang	constuction	tree	Observed	DSF, FA	8	7	x	8	8	10
<i>Leguminosae Senna siamea</i>	Mai khi leck	firewood and young leaf edible	small tree	Observed	DSF, FA	x	x	x	x	x	4
<i>Lythraceae Lagestroemia blansae</i>	Mai pua	constuction	small tree	Observed	DSF, FA, PF, G, RB	10	8	8	6	8	7
<i>Myrtaceae Syzygium cinereum</i>	Mai var	constuction	tree	Observed	DSF, FA	8	8	8	7	8	7
<i>Palmae Arenga westerhoutii</i>	Tao	shoot edible	seedling	Observed	DSF, FA	4	6	6	7	x	7
<i>Palmae Calamus bymaniferus</i>	Wai hang nou	shoot edible	stem	Observed	DSF, FA	x	x	x	x	x	x

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<i>Palmeae</i>	<i>Calamus viminalis</i>	Wai toon	shoot edible	seedling	Observed	DSF, FA	10	10	6	7	5	5
<i>Palmeae</i>	<i>Daemonorops jenkinsiana</i>	Wai boun	shoot edible	seedling	Observed	DSF, FA	3	3	x	7	x	9
<i>Palmeae</i>	<i>Rhapis laoensis</i>	Saan	shoot edible	seedling	Observed	DSF, FA	5	5	6	7	6	8
<i>Pandanaceae</i>	<i>Pandanus</i>	Tuei	handicraft	shrub	Observed	DSF, FA	x	x	x	x	x	5
<i>Passifloraceae</i>	<i>Passiflora foetida</i>	Pak bouang	food	vine	Observed	DSF, FA	1	x	x	8	x	3
<i>Pterocarpaceae</i>	<i>Pterocarpus macrocapus</i>	Mai dou	constuction	medium tree	Observed	DSF, FA, PF, G, RB	8	8	7	7	8	7
<i>Simarubaceae</i>	<i>Eurycoma harmandiana</i>	Hark ian dorn	medicine	small tree	Observed	DSF, FA	x	x	x	x	x	4
<i>Sterculiaceae</i>	<i>Helicteres viscidula blumei</i>	Nha khi on	animal forage	herb	Observed	FA	5	7	5	6	5	6
<i>Verbenaceae</i>	<i>Gmelina arborea</i>	Mai so	constuction	tree	Observed	DSF, FA	8	8	7	6	8	8
<i>Zingiberaceae</i>	<i>Alinia malaccaensis</i>	Kha pa	root edible	herb	Observed	DSF, FA	8	8	7	6	7	6
<i>Zingiberaceae</i>	<i>Cardamom spp</i>	Mark neang	Fruit edible	herb	Observed	DSF,	10	10	10	10	10	8
	<i>Anthocephalus chinensis</i>	Mai sa ko	constuction	tree	Observed	DSF, FA	x	x	x	x	x	x
	<i>Banana flower</i>	Kuay pa	flower edble	wild flower	Observed	DSF, FA	8	8	5	x	5	8
<i>Tonnidaceae</i>	<i>Dalium cochinchinansis</i>	Mai kheng	firewood	tree	Observed	DSF, FA	8	7	8	7	8	8
	<i>Schima wallichii</i>	Mai mi	constuction	Tree	Observed	DSF, FA	10	8	8	10	8	5
<i>Passifloraceae</i>	<i>Passiflora foetida</i>	Par bouang	eating	Vin	Observed	DSF, FA	6	6	7	x		3
	<i>Broussonetia papyrifera</i>	Po sa	fiber	small tree	Observed	DSF, FA	2	2	x	x		x
<i>Lauraceae</i>	<i>Persea kurzii</i>	Puak bong	resin	bark	Observed	-	4	x	2	6	3	6
<i>Graminaceae</i>	<i>Broom grees</i>	Kham		vine	Observed	DSF, FA	3	3	4	x	2	

<i>Smilac eae</i>	<i>Smilax glabra</i>	Nha houa	medicine	vine	Observed	DSF, FA	x	6	6		
<i>Orchidaceae</i>	<i>Orchid spp</i>	Dok pueng	medicine	seedling	Observed	DSF, FA	x	x	x	2	x

Remarks:

Where no ranking was recorded an 'x' has been used

Where number 1-10 signifies village ranking of importance of species. 1 lowest, 10 highest

Annex 3.3 Vilabouri

Mammals recorded in Vilabouri District - Savannakhet Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland; PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	Observed/Interview	Habitat	Angkham	Kokmak	Na Namsang	Sop Pa	Na Sa Loh	Pah Phak Naou	Vang Mahang
Cervidae	Red Muntjac - <i>Muntiacus muntjac</i>	ຝານເລົ່າ Faan		DSF/FA		+		+		+	+
Sciuridae	Pallars' Squirrel - <i>Callosciurus erythraeus</i>	ກະຮອກຫ້ອງແດງ Ka Hok		DSF	+		+	+	+	+	+
Suidae	Common wild pig - <i>Sus scrofa</i>	ໝູຝາ Moo Pah		DSF	+	+		+	+	+	+
Hystricidae	Bush-tailed Porcupine - <i>Atherurus macrourus</i>	ຫອນ Horn		DPF					+		+
Hystricidae	Porcupine - <i>Hystrix brachyuran</i>	ເໝີນ Menh		DPF		+				+	+
Viverridae	Large spotted Civet - <i>Viverra zibetha</i>	ເຫງິນຫາງນ້ຳ Ngenh Hangkaan		DPF/DSF			+		+		+
Cercopithecidae	Monkeys - <i>Macaca spp.</i>	ລິງ Ling		DPF/DSF	+	+		+			+
Cercopithecidae	Douc Langur - <i>Pygathix nemaeus</i>	ຂາແດງ Kha Deang		DPF/DSF							+
Cervidae	Lesser Mouse Deer - <i>Tragulus javanicus</i>	ໄກ້ Kai		FA/DSF		+					+
Murinae	Large Bandicoot Rat - <i>Bandicota indica</i>	ໝູ່ພາກ Noo		FA		+	+	+			

Remarks:

The mammal species recorded during the village interviews have not been confirmed but based on the villagers perceptions.

Birds recorded in Vilabuly District - Savannakhet Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland; PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Name	Observed/ Interview	Habitat	Na Nam Sang	Pak Now	Saloh	Wang Mahang	Angkam
Corvidae	Black Drongo – <i>Dicrurus macrocercus</i>	O	DPF				+	
Muscicapidae	Asian Brown Flycatcher – <i>Muscicapa dauurica</i>	O	DSF, HG;DPF	+	+		+	
	Red-throated Flycatcher – <i>Ficedula parva</i>	O	DSF;DPF				+	
Nectariniidae	Purple Sunbird – <i>Nectarinia asiatica</i>	O	DSF, HG		+			
	Brown-throated Sunbird - <i>Anthreptes malacensis</i>	O	DSF, HG	+		+	+	+
	Purple - throated Sunbird - <i>Nectarinia sperata</i>	O	DSF, HG		+		+	+
Zosteropidae	Oriental White-eye – <i>Zosterops palpebrosus</i>	O	DSF, HG, DPF				+	
Pycnonotidae	Red-whiskered Bulbul – <i>Pycnonotus jocosus</i>	O	DSF, HG	+		+		+
	Black-crested Bulbul – <i>Pycnonotus melanicterus</i>	O	DSF,HG		+	+	+	+
	Sooty-headed Bulbul – <i>Pycnonotus aurigaster</i>	O	DSF,HG	+			+	+
	Streak-eared Bulbul – <i>Pycnonotus blanfordi</i>	O	DSF			+	+	
Apodidae	House Swift – <i>Apus affinis</i>	O	FS,G			+		
	Asian Palm Swift - <i>Cypsiurus balasiensis</i>	O	FS,G			+		
Accipitridae	Shikra – <i>Accipiter badius</i>	O	DSF					+
	Serpent Eagle - <i>Spilornis cheela</i>	O	DSF		+			

Phasianidae	Red junglefowl – <i>Gallus gallus</i>	O	DSF		+			
Cisticolidae	Grey-breasted prinia – <i>Prinia hodgsonii</i>	O	G,DSF, FS, PF				+	
	Plain prinia – <i>Prinia inornata</i>	O	G,DSF, FS, PF	+			+	
	Yellow-bellied prinia – <i>Prinia flaviventris</i>	O	G,DSF, FS		+			+
	Rufescent Prinia - <i>Prinia rufescens</i>	O	G,DSF, FS		+		+	+
	Brown Prinia - <i>Prinia Polychroa</i>	O	G,DSF, FS					+
Sylviidae	Lanceolated warbler – <i>Locustella lanceolata</i>	O	TGB, S, DSF		+		+	+
	Dark-backed Tailorbird - <i>Orthotomus atrogularis</i>	O	HG, DSF		+			
	Common tailorbird – <i>Orthotomus sutorius</i>	O	DSF, HG, DS, PF	+	+	+	+	+
Centropodidae	Greater coucal – <i>Centropus sinensis</i>	O	DSF, HG				+	
Passeridae	Forest wagtail – <i>Dendronanthus indicus</i>	O	DSF, RB					+
	Grey wagtail – <i>Motacilla cinerea</i>	O	RB, PF,G				+	+
Passeridae	White-rumped munia – <i>Lonchura striata</i>	O	DSF, FS,G,PF	+				
	Scaly-breasted munia – <i>Lonchura punctulata</i>	O	DSF, FS,G,PF	+				
Corvidae	Black-naped Oriole – <i>Oriolus chinensis</i>	O	DPF					+
Sylviidae	Puff-throated Babbler - <i>Pellorneum ruficeps</i>	O	DPF, DSF		+			
	Chestnut-capped Babbler - <i>Timalia pileata</i>	O	DPF, DSF, FS					
Columbidae	Green Imperial Pigeon – <i>Ducula aenea</i>	O	DSF					+
	Red Collard Dove – <i>Streptopelia tranquebarica</i>	O	DSF, HG				+	+
	Spotted Dove – <i>Streptopelia chinensis</i>	O	DSF, HG	+			+	
Nectariniidae	Scarlet-backed Flowerpecker – <i>Dicaeum cruentatum</i>	O	DSF, HG	+				+

Corvidae	Scarlet Minivet - <i>Pericrocotus flammeus</i>	O	DSF, DPF, HG	+			+		
	Small Minivet - <i>Pericrocotus cinnamomeus</i>	O	DSF, DPF, HG	+			+		+
	Ashy Minivet - <i>Pericrocotus divaricatus</i>	O	DSF, DPF, HG			+			+
	Bar-winged Flycatcher Shrike - <i>Hemipus picatus</i>	O	DSF, DPF, HG				+		
Megalaimidae	Lineated Barbet - <i>Megalaima lineata</i>	O	DSF, DPF				+		+
Picidae	Rufous Woodpecker - <i>Celeus brachyurus</i>	O	DSF, DPF				+		+
Irenidae	Common Iora - <i>Aegithina tiphia</i>	O	DSF, HG	+			+		
Cuculidae	Green-billed Malkoha - <i>Phaenicophaeus tristis</i>	O	DSF, DPF			+			+
Laniidae	Brown Shrike - <i>Lanius cristata</i>	O	FS, HG	+					+
Corvidae	Black-naped Monarch - <i>Hypothymis azurea</i>	O	DSF				+		
	White-browed Fantail - <i>Rhipidura aureola</i>	O	DSF, HG				+		

Amphibians & Reptiles recorded in Vilabouri District - Savannakhet Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland; PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	Observed/ Interview	Habitat	Angkham	Kokmak	Na Namsang	Sop Pa	Na Saloh	Pah Phak Naou	Vang Mahang
Amphibians											
Ranidae	Frog - <i>Amolops cremnobatus</i>	Kob, Khiad	i		+	+	+	+	+	+	+
Reptiles											
Varanidae	Monitor - <i>Varanus bengalensis</i>	Lane	i	DPF				+	+	+	
Agamidae	Water Dragon - <i>Pysignathus cocincinus</i>	Ka Thang	i	RB				+			

Trionychidae Softshell turtle - *Amyda sp* Pa fa ong i RB, R + + + + + + +

Remarks:

The amphibian and reptiles species recorded during the village interviews have not been confirmed but based on the villagers perceptions.

Freshwater fish recorded in Vilabouri District - Savannakhet Province

(Habitats: PF - Paddy Fields; RB - River Bank; R,S - River, Stream, L - Lake)

Family	Common & Scientific Name	Lao Name	Observed / Interview	Habitat	Angkham	Kokmak	Na Namsang	Sop Pa	Na Saloh	Pah Phak Naou	Vang Mahang
Channidae	<i>Channa striata</i>	Pa Khoh		RS	+	+	+	+	+	+	+
Cyprinidae	<i>Trichogaster trichopterus</i>	Pa Ka Deut		RS			+	+	+	+	+
Claridae	<i>Clarias macrocephalus</i>	Pa Douk		RS	+	+		+	+		
Cyprinidae	<i>Cirrhinus molitorella</i>	Pa Kheng		RS					+	+	
Cyprinidae	<i>Barbodes gonionotus</i>	Pa Pak		RS							+
Cyprinidae	<i>Poropuntius sp.</i>	Pa Chat		RS	+			+			+
Bagridae	<i>Hemibagrus sp.</i>	Pa Kot		RS	+			+		+	+
Bagridae	<i>Mystus microphthalmus</i>	Pa Kuan		RS							+
Cyprinidae	<i>Systemus aurotaeniatus</i>	Pa Khao		RS	+						
Mastacembelidae	<i>Mastacembelus favus</i>	Pa Lad		RS	+			+			
Cyprinidae	<i>Labiobarbus leptocheilus</i>	Pa Phouk		RS				+			
Cyprinidae	<i>Coius undecimradiatus</i>	Pa Sew		RS		+					
Synbranchidae	<i>Monopterus albus</i>	Ian		RS	+	+		+			

Remarks:

The fish species recorded during the village interviews have not been confirmed but based on the villagers perceptions.

Plants recorded in Vilabouri District - Savannakhet Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland;
PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	General Use	Life form	Observed/ Interview	Habitat	Angk ham	Ko km ak	Na Na ms ang	So p Pa	Sa Lo h	Pa h Ph ak Na ou	Va ng Ma ha ng
Zingiberaceae	Amomum	Mark neng	fruits edible	shrub	0	Fallow land	4						
Zingiberaceae	Amomum (green)	Mark neng khieu	fruits edible	shrub	0	Fallow land		4					2
Zingiberaceae	Amomum (red)	Mark neang deng	fruit for medicine	shrub	0	Fallow land		4					
Ancardiaceae	<i>Spondias pinrata</i>	Mai kok	fruits edible and for medicine	tree	0	Gardens	4						
Apocynaceae	<i>Alstonia scholaris</i>	Mai tin pet	medicine	tree	0	Fallow land		2					1
Apocynaceae	<i>Alstonia rostrata</i>	Mai tin nok	firewood	tree	0	Fallow land	3						
Apocynaceae	<i>Wrightia arborea</i>	Mai mouk	support for growing pepper	tree	0	Fallow land	4			3			
Palmae	<i>calamus sp.</i>	Wai sa noi	shoot for medicine and cane for furniture	stem	0	Protected Forest		3					
Bombacaceae	<i>Bombax ceiba</i>	Mai ngieu	fruit edible and medicine	tree	0	Gardens	1	5					
Combretaceae	<i>Combretum decandrum</i>	Kheua Wai din	using vines for construction	stem	0	Fallow land	2						
Datisceae	<i>Tetramelas nudiflora</i>	Mai poug	cane for house construction	tree	0	Forest product		1					
Dioscoreaceae	<i>Casava</i>	Mann toon	edible roots	crop	0	Gardens		1					
Dipterocarpaceae	<i>Dipterocarpus alatus</i>	Mai nhang	wood for house construction	tree	0	Protected Forest		3					
Dipterocarpaceae	<i>Hopea odorata</i>	Mai khene heua	wood for house construction	tree	0	Fallow land				2			
Dipterocarpaceae	<i>Vatica harmandii</i>	Mai see	wood for house construction	tree	0	Fallow land						3	
Euphorbiaceae	<i>Phyllanthus emblica</i>	Mai kham pom	fruits edible and for medicine	small tree	0	Gardens		3	3				
Moraceae	<i>Ficus fistulosa</i>	Mai deua	animals forage	small	0	Fallow land	4						

Moraceae	<i>Ficus sp.</i>	Mai hai	animals forage	tree	0	Fallow land	1				2
Flacourtiaceae	<i>Casearia floranos</i>	mai poa	wood for house constuction	tree	0	Forest product		3	2		1
Agiracacae - fungi	<i>Lentinus sp (mushroom)</i>	Heet	edible food		0	Forest product			3		
Graminae	<i>Bambusa blumeana</i>	Mai phai baan	edible shoots and cane for construction	shrub	0	Gardens	1				
Graminae	<i>Bambosa arundinacea</i>	Mai pai men mou	edible shoots and cane for construction	shrub	0	Fallow land		2			
Graminae	<i>Bambusa nana</i>	Mai sang phay	edible shoot	shrub	0			3			
Graminae	<i>Bambusa nutans</i>	Mai bong	edible shoot	shrub	0	Forest product			4		
Graminae	<i>Broom grees</i>	Khem	edible shoot	shrub	0	Forest product			3		
Graminae	<i>Dendrocalamus lonoifimbriatus</i>	Mai phang	edible shoots and cane for construction	shrub	0	Forest product		2	2		
Graminae	<i>Dendrocalamus membranaceaus</i>	Mai sang	edible shoots and cane for construction	shrub	0	Fallow land					3
Graminae	<i>Gigantochloa apus</i>	mai lai	edible shoots and cane for construction	shrub	0	Fallow land					5
Graminae	<i>Bambusa flexuosa</i>	Mai ka sa	edible shoots and cane for construction	shrub	0	Fallow land					2
Graminae	<i>Oxytenanthera parviflora</i>	Mai soot	edible shoots and cane for construction	shrub	0	Fallow land		2			2
Graminae	<i>Phyllostochys</i>	Mai warn	edible shoots and cane for construction	shrub	0	Forest product	4			4	
Graminae	<i>Schizostachys grandis</i>	Mai poung chin	edible shoots and cane for construction	shrub	0	Forest product			1		2
Graminae	<i>Schizostachyum blumei</i>	Mai hia	edible shoots and cane for construction	shrub	0	Fallow land					1 1
Gramnae	<i>Dendrocalamus Brendisii</i>	Mai sang pai	edible shoots and cane for construction	shrub	0	Gardens		2		3	
Hypericaceae	<i>Cratoxytum formosum</i>	Mai te	firewood	tree	0	Fallow land	5	5		5	5
Irvingiaceae	<i>Irvingia malayana</i>	Mai bok	firewood	tree	0	Forest product	3		4	3	3

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Lauraceae	<i>Persea kurzii</i>	Mai nhang bong	wood for construction	tree	0	Gardens		2		
Lauraceae	<i>Schima wallichii</i>	Mai mee	edible fruits and cane for construction	tree	0	Forest product			4	
Leguminosae - Papilionatae	<i>Dalbergia cochinchinensis</i>	mai kham phee	high value wood for house construction	tree	0	Evegree forest				4
Leguminosae - Papilionatae	<i>Dalbergia sp</i>	Mai ka cha	high value wood for house construction	tree	0	Evegree forest				2
Leguminisae	<i>Ormosia semicastrata</i>	Mai mark lam	wood for house constuction	tree	0	Forest product	1		2	
Leguminosae	<i>Acacia megdalena</i>	Nam khi het	firewood	small tree	0	Protected Forest	4	3		
Leguminosae	<i>Afzylia xylocarpa</i>	Mai te kha	wood for house constuction	tree	0	Fallow land				2
Leguminosae	<i>Dalbegia bariensis</i>	Mai kham phab	edible fruits and medicine	tree	0	Fallow land		1		
Leguminosae	<i>Parkia sumatrana</i>	Mai houa lon	wood for house constuction	tree	0	Protected Forest		3		
Leguminosae	<i>Peltaphorum desyrachis</i>	Mai sa fang	firewood	tree	0	Protected Forest	5	5	5	
Lythraceae	<i>Lagestroemia balansae</i>	mai peuy	wood for house constuction	tree	0	Fallow land	4			4
Meliaceae	<i>Aphanamyxis cochinchinensis</i>	Mai ta sua	firewood	tree	0	Fallow land			1	1
Meliaceae	<i>Azadirachta indica</i>	mai ka dao	edible fruits and medicine	tree	0	Gardens				1
Meliaceae	<i>Sandoricum koetsape</i>	mai tong	edible fruits and medicine	tree	0	Protected Forest		2		
Meliaceae	<i>Xylia xylocarpa</i>	Mai deng	wood for house constuction	tree 3m	0	Fallow land	1-3			2
Myrtaceae	<i>Syzygium cinereum</i>	mai var	edible fruits and wood for constuction	tree	0	Fallow land				1
Palmae	<i>Arenga pinnata</i>	Tao tat	edible fruits (sugar palm)	tree	0	Forest product		2		
Palmae	<i>Calamus bymaniferus</i>	Wai hang nou	use canes for house equipment	shrub 3-4 m	0	Forest product	5	5		
Palmae	<i>Calamus palustris</i>	Wai nam hang	edible shoots and cane for construction	shrub	0	Forest product	1-3	1	3	
Palmae	<i>Calamus tetradactylus</i>	Wai hang nou	edible shoots and cane for construction	shrub	0	Forest product	5			

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Palmae	<i>Calamus viminalis</i>	Wai toon	edible shoots and cane for construction	shrub	0	Forest product	5	2	5	5	5
Palmae	<i>Daemonorops jenkinsiana</i>	Wai boun	edible shoots and cane for construction	shrub	0	Forest product					4
Palmae	<i>Rhapis laoensis</i>	Saan	edible shoots	herb	0	Forest product	5	3	5		3
Pandanaceae	<i>Pendanus</i>	Tueay	edible leaves	herb	0	Fallow land					2
Passifloraceae	<i>Passiflora foetida</i>	Phak bouang	edible leaves	vine	0	Gardens		1			
Pterocarpaceae	<i>Pterocarpus macrocapus</i>	Mai dou	wood for house constuction	tree	0	Fallow land					3
Sapindaceae	<i>Spindus rarak</i>	Mai mark sack	edible fruits	tree	0	Fallow land	3				
Simaroubeceae	<i>Eurycoma harmandiana</i>	Hark ian dorn	roots for medicine	small shrub	0	Forest product	4				2
Smilacaceae	<i>Smilax glabra</i>	Nha houa	medicine	stem	0	Fallow land					3
Myrtaceae	<i>Syzygium cinereum</i>	Mark khaan	edible fruits	tree	0	Forest product					2
Tiliaceae	<i>Pentace buimanica</i>	Mai see siat	bark for chew	tree	0	Gardens		2			
Tonnidae	<i>Dalium cochinchinansis</i>	Mai kheng	edible fruits and wood for constuction	tree	0	Forest product			3		
Verbenaceae	<i>Gmelina arborea</i>	Mai so	using	tree	0	Fallow land	3				
Zingiberaceae	<i>Alpinia malacensis</i>	Kha khom	edible fruits	herb	0	Fallow land	3	4			
Zingiberaceae	<i>Alpinia sp</i>	Kha pa	edible roots	herb	0	Rever bank		3			
Leguminosae-mimosoidae	<i>Acacia concina</i>	Som poi kham	edible fruits	small tree	0	Gardens	1				
Theaceae	<i>Schima wallichii</i>	Mai khai so	firewood	tree	0	Fallow land					1
Melastomataceae	<i>Memecyclon harmandii</i>	Mai khao saan	medicine	tree	0	Fallow land					1
Rosaceae	<i>Parinari annamensis</i> Hance	Mai phork	wood for house constuction	tree	0	Fallow land					2
Combretaceae	<i>Terminalia spp</i>	Mai henn	wood for house constuction	tree	0	Rever bank	1			2	1
Moraceae	<i>Artocarpus lakoocha</i>	Mai hat	wood for house constuction	tree	0	Fallow land				2	1
Pinaceae	<i>Pinus merkusii</i>	Mai kie	wood for house constuction	tree	0	Fallow land	2				
Leguminosae - Papilionatae	<i>Ormosia cambodiana</i>	Mai khie mou	firewood	tree	0	Forest product			3		
?	<i>Microcos paniculata</i>	Mai khom	fruit edible for animals	small tree	0	Fallow land	4				

Gramineae	<i>Erianthus arundinaceae</i>	Mai lao som	wood for house constuction	tree	0	Forest product			3
Elaeocarpaceae	<i>Elaeocarpus spp</i>	Mai moun	firewood	tree	0	Forest product		1	
Moraceae	<i>Broussonetia papyrifera</i>	Po sa	using bark for papers	small tree	0	Fallow land	4		
Euphorbiaceae	<i>Trewia nudiflora</i>	Mai porp	wood for construction	tree	0	Rever bank			2
Sonneratiaceae	<i>Duabanga grandiflora</i>	Mai ten	edible fruits	tree	0	Gardens	3		
Combretaceae	<i>Terminalis bellirica</i>	Mai haen	wood for constuction	tree	0	Fallow land	2		
Compositae	<i>Eupatorium odoratum</i>	Nha frang	grass for medicine	-small tree	0	Fallow land	4		
Araliaceae	<i>Heteropanax fragrans</i>	Oi sang	firewood	tree	0	Fallow land	1		
Guttiferae	<i>Calophyllum thorelii</i>	Mai ka la puak	firewood	tree	0	Gardens		2	
Bignoniaceae	<i>Stereospermum fimbriatum</i>	Mai khaa khom	edible fruits	tree	0	Fallow land		4	

Remarks:

Where number 1-10 signifies village ranking of importance of species. 1 lowest, 10 highest

Where no ranking was recorded an 'x' has been used

Annex 3.4 Taoy

Mammals recorded in Ta Oy District – Salavan Province

(Habitats: HG – Home Gardens; DPF – Dense Primary Forest; DSF – Degraded Secondary Forest; FA – Fallow Scrubland;
PF – Paddy Fields; G – Grasslands; RB – River Bank)

Family	Common & Scientific Name	Lao Name	Observed/ Interview	Habitat	Lapeuan g	Gang	Joravien g	Te n	Seun gta moo ng	Doub
Bovidae	Wild Water Buffalo – <i>Bubalus arnee</i>	ຄວາຍປ່າ	i	not recorded				5		
Bovidae	Banteng – <i>Bos javanicus</i>	ງົວປ່າ	i	not recorded				3		
Ursidae	Sunbear – <i>Ursus malayanus</i>	ເໝືອຍ	i	not recorded				5		
Felidae	Leopard – <i>Panthera pardus</i>	ເສືອດາວ	i	not recorded				2		
Felidae	Marble cat – <i>Felis marmorat</i>	ເສືອແມວລາຍຫີນອ່ອນ	i	not recorded				5		
Bovidae	Southern Serow – <i>Naemorhedus sumatrensis</i>	ເຍືອງ	i	not recorded				5		5
Cercopithecidae	Douc Langur – <i>Pygathrix nemaeus</i>	ຂາແດງ	i	not recorded	5	5	5		1	5
Hylobatidae	Gibbon Species – <i>Hylobates - leucogenys/gabrieilae sp.</i>	ໝີ່ນີ ທຸກຊະນິດ	i	not recorded	2	2	4			5
Cercopithecidae	Silvered Langur – <i>Presbytis cristatus</i>	ຄ່າງ (ຕະຫລຸງ)	i	not recorded					1	
Cervidae	Roosevelts' Muntjac – <i>Muntiacus rooseveltorum</i>	ພານດົງ	i	not recorded	5	5	5			5
Pteromyidae	Giant Flying Squirrel – <i>Ratufa bicola</i>	ປ່າງລີ້ວ	i	not recorded	5	2	5		1	5
Manidae	Pangolin – <i>Manis javanicus</i>	ລິ້ນ	i	not recorded			5			4
Loridae	Slow Loris Species – <i>Nycticebus sp.</i>	ໝີ່ລົມ ທຸກຊະນິດ	i	not recorded	3	5	5		5	5
Canidae	Dhole – <i>Cuon alpinus</i>	ໝາໄນ	i	not recorded	5		3			5

				recorded						
Viverridae	Large Spotted Civet – <i>Viverra megaspila</i>	ເຫງິນຫາງກ່ານ	i	not recorded	5	5	5	4	5	
Viverridae	Binturong – <i>Arctictis binturong</i>	ເຫງິນໝີ	i	not recorded		3				
Viverridae	Common Palm Civet <i>Paradoxurus hermaphroditus</i>	ເຫງິນອີ້ມ	i	not recorded		5	5	5	5	
Mustelidae	Back-striped Weasel – <i>Mustela strigidorsa</i>	ຈອນຟອນຫລັງຂາວ	i	not recorded						5
Cervidae	Red Muntjac – <i>Muntiacus muntjac</i>	ຟານເລົ່າ	i	not recorded	5		2	5	5	
Tragulidae	Lesser Mouse Deer – <i>Tragulus javanicus</i>	ໄກ້	i	not recorded	3		5	3	5	
Mustelidae	Hog-Nosed Badger – <i>Arctonyx collaris</i>	ໝູ່ລິ້ງ	i	not recorded	5					5
Cercopithecidae	Monkeys – <i>Macaca sp.</i>	ໝູ່ກຊະນິດ	i	not recorded			5	2	5	5
Sciuridae	Black Giant Squirrel – <i>Ratufa bicolor</i>	ກະຮອກໝໍ້	i	not recorded	5	5	5	5	5	
Leporidae	Siamese Hare – <i>Lepus peguensis</i>	ກະຕ່າຍປ່າ	i	not recorded			5	5	5	
Spalacidae	Large Bamboo Rat - <i>Rhizomys sumatrensis</i>	ອີ້ນ ໃຫຍ່	i	not recorded		5	5	3	5	5
Suidae	Common wild pig– <i>Sus scrofa</i>	ໝູ່ປ່າ	i	not recorded		5	5	3	5	
Sciuridae	Red-cheeked Squirrel - <i>Dremomys rufigenis</i>	ກະຮອກດິນແກ້ມແດງ	i	not recorded	5		5	5	5	
Sciuridae	Pallars's Squirrel – <i>Callosciurus erythraeus</i>	ກະຮອກທອງແດງ	i	not recorded			5	5	5	5
Sciuridae	Irrawaddy Squirrel – <i>Callosciurus pygerythrus</i>	ກະເລນ	i	not recorded		5	5	5	5	5

Remarks:

The mammal species recorded during the village interviews have not been confirmed but based on the villagers perceptions.

Birds recorded in Taoy District - Saravan Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest;
FA - Fallow Scrubland; PF - Paddy Fields; G - Grasslands; RB - River Bank; S - Stream

Family	Name	Observed/ Interview	Habitat	Lapeung	Kang	Jolaviang	Tan	Seungtam ong	Douk
Corvidae	Black Drongo – <i>Dicrurus macrocerus</i>	O	DPF	+				+	
	Spangled Drongo - <i>Dicrurus hottentottus</i>	O				+			+
Muscicapidae	Asian Brown Flycatcher – <i>Muscicapa dauurica</i>	O	DSF, HG;DPF	+	+	+	+	+	
	Blue Flycatcher - <i>Cyornis</i> spp.	O	DPF,DSF		+				
	Red-throated Flycatcher – <i>Ficedula parva</i>	O	DSF;DPF		+				+
Nectariniidae	Purple Sunbird – <i>Nectarinia asiatica</i>	O	DSF, HG			+	+		
	Brown-throated Sunbird - <i>Anthreptes malacensis</i>	O	DSF, HG	+	+		+		+
	Purple - throated Sunbird - <i>Nectarinia sperata</i>	O	DSF, HG		+	+		+	
Zosteropidae	Oriental White-eye – <i>Zosterops palpebrosus</i>	O	DSF, HG, DPF	+	+	+	+	+	+
Pycnonotidae	Red-whiskered Bulbul – <i>Pycnonotus jocosus</i>	O	DSF, HG	+	+				+
	Black-headed Bulbul - <i>Pycnonotus atriceps</i>	O	DSF		+	+	+		+
	Black-crested Bulbul – <i>Pycnonotus melanicterus</i>	O	DSF,HG	+	+			+	
	Sooty-headed Bulbul – <i>Pycnonotus aurigaster</i>	O	DSF,HG	+		+		+	
	Streak-eared Bulbul – <i>Pycnonotus blanfordi</i>	O	DSF		+		+		+
Apodidae	House Swift – <i>Apus affinis</i>	O	FS,G			+			
	Asian Palm Swift - <i>Cypsiurus balasiensis</i>	O	FS,G				+		
Accipitridae	Shikra – <i>Accipiter badius</i>	O	DSF		+				

	Serpent Eagle - <i>Spilornis cheela</i>	O	DSF		+				
Phasianidae	Red junglefowl – <i>Gallus gallus</i>	O	DSF				+		
Cisticolidae	Grey-breasted prinia – <i>Prinia hodgsonii</i>	O	G,DSF, FS, PF				+	+	
	Plain prinia – <i>Prinia inornata</i>	O	G,DSF, FS, PF	+					+
	Yellow-bellied prinia – <i>Prinia flaviventris</i>	O	G,DSF, FS					+	+
	Rufescent Prinia - <i>Prinia rufescens</i>	O	G,DSF, FS		+		+		
	Brown Prinia - <i>Prinia Polychroa</i>	O	G,DSF, FS	+					+
	Bright-headed Cisticola - <i>Cisticola exilis</i>	O	PF				+		+
Sylviidae	Lanceolated warbler – <i>Locustella lanceolata</i>	O	TGB, S, DSF				+		
	Yellow-browed Warbler - <i>Phylloscopus inornatus</i>	O	FS	+			+	+	+
	Dark-backed Tailorbord - <i>Orthotomus atrogularis</i>	O	HG, DSF				+		+
	Common tailorbird – <i>Orthotomus sutorius</i>	O	DSF, HG, DS, PF	+	+		+	+	+
Centropodidae	Greater coucal – <i>Centropus sinensis</i>	O	DSF, HG				+		+
Passeridae	Forest wagtail – <i>Dendronanthus indicus</i>	O	DSF, RB				+		
	Yellow Wagtail - <i>Motacilla flava</i>	O	RB						+
	Paddyfield Pipit - <i>Anthus rufulus</i>	O	PF						+
	Grey wagtail – <i>Motacilla cinerea</i>	O	RB, PF,G				+	+	+
Passeridae	White-rumped munia – <i>Lonchura striata</i>	O	DSF, FS,G,PF	+					
	Scaly-breasted munia – <i>Lonchura punctulata</i>	O	DSF, FS,G,PF				+		
Corvidae	Black-naped Oriole – <i>Oriolus chinensis</i>	O	DPF				+		
Sylviidae	Puff-throated Babbler - <i>Pellorneum ruficeps</i>	O	DPF, DSF				+		
	Striped Tit Babbler - <i>Macronous gularis</i>	O	DSF,	+					+

	Chestnut-capped Babbler - <i>Timalia pileata</i>	O	DPF, DSF, FS		+			+	
Columbidae	Green Imperial Pigeon – <i>Ducula aenea</i>	O	DSF		+				+
	Red Collard Dove – <i>Streptopelia tranquebarica</i>	O	DSF, HG			+		+	
	Spotted Dove – <i>Streptopelia chinensis</i>	O	DSF, HG	+					
	Emerald Dove - <i>Chalcophaps indica</i>	O			+				+
	Green Pigeon - <i>Treron</i> spp.	O		+		+			+
Nectariniidae	Scarlet-backed Flowerpecker – <i>Dicaeum cruentatum</i>	O	DSF, HG	+		+		+	+
	Thick-billed Flowerpecker - <i>Dicaeum agile</i>	O			+	+			+
Corvidae	Scarlet Minivet - <i>Pericrocotus flammeus</i>	O	DSF, DPF, HG	+		+			
	Small Minivet - <i>Pericrocotus cinnamomeus</i>	O	DSF, DPF, HG	+	+			+	
	Ashy Minivet - <i>Pericrocotus divaricatus</i>	O	DSF, DPF, HG		+	+			+
	Large Cuckooshrike - <i>Coracina macei</i>	O	DSF, DPF						+
	Bar-winged Flycatcher Shrike - <i>Hemipus picatus</i>	O	DSF, DPF, HG			+			
Megalaimidae	Lineated Barbet - <i>Megalaima lineata</i>	O	DSF, DPF	+	+	+		+	+
	Blue-eared Barbet - <i>Megalaima australis</i>	O	DSF, DPF	+		+			+
	Coppersmith Barbet - <i>Megalaima haemacephala</i>	O	DSF, DPF, HG	+	+	+		+	+
Picidae	Rufous Woodpecker - <i>Celeus brachyurus</i>	O	DSF, DPF			+			
	Lesser Yellow-nape - <i>Picus cholerocephus</i>	O	DSF			+			
Corvidae	Common Iora – <i>Aegithina tiphia</i>	O	DSF, HG	+	+	+			+
Cuculidae	Green-billed Malkoha - <i>Phaenicophaeus tristis</i>	O	DSF, DPF			+			
Laniidae	Brown Shrike - <i>Lanius cristata</i>	O	FS, HG	+		+			

Corvidae	Black-naped Monarch - <i>Hypothymis azurea</i>	O	DSF		+				
	White-browed Fantail - <i>Rhipidura aureola</i>	O	DSF, HG					+	
Bucerotidae	Great Hornbill - <i>Buceros bicornis</i>	O	DSF, DPF					+	+
Ardeidae	Intermediate Egret - <i>Egretta intermedia</i>	O	PF, S		+				
	Little Egret - <i>Egretta garzetta</i>	O						+	
	Chinese Pond Heron - <i>Ardeola Bacchus</i>	O						+	
Corvidae	Large-billed Crow - <i>Corvus macrorhynchus</i>	O	DSF, HG					+	
Psittacidae	Vernal Hanging Parrot - <i>Loriculus vernalis</i>	O	DSF, DPF		+	+	+		+
Sturnidae	Common Myna - <i>Acridotheres tristis</i>	O	PF, HG,					+	
	White-vented Myna - <i>Acridotheres grandis</i>	O	DSF			+		+	+
	Hill Myna - <i>Gracula religiosa</i>	O	DSF, DPF				+		+
Ploceidae	Baya Weaver - <i>Ploceus philippinus</i>	O	DSF					+	
Meropidae	Bee-Eater - <i>Merops</i> spp.	O	DSF						+

Amphibians & Reptiles recorded in Ta Oy District - Salavan Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland; PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	Observed/Interview	Lapeuang	Gang	Joravieng	Ten	Seunsta moong	Doub
Elapidae	- <i>Ophiophagus hannah</i>	ງູຈີ່ອາງ	1				5		5
Boidae	Reticulated Python - <i>Python reticulatus</i>	ງູເສື້ອນ	1	3	1	4			5
Varanidae	Bangal Monitor - <i>Varanus bengalensis</i>	ແລນ	1		5	5		5	5

Agamidae	Water Dragon - <i>Pysignathus cocincinus</i>	ກະທໍ່າງ				5		1	5
Trionychidae	Softshell Turtle- <i>Amyda sp.</i>	ປາຝາອອງ							5
Elepidae	Cobra species - <i>Naja sp.</i>	ງູເຫີ່າ		3		3		5	
Colubridae	Indo-chineses Rat Snake - <i>Zamenis sp.</i>	ງູສິງດົງ		5	5	5		5	5

Remarks:

The amphibian and reptile species recorded during the village interviews have not been confirmed but based on the villagers perceptions.

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Freshwater fish recorded in Ta Oy District - Salavan Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland; PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao name	Observed/ Interview	Lapeuang	Gang	Joravieng	Ten	Seunstamoon g	Doub
Cyprinidae	<i>Poropuntius sp.</i>	ປາຈາດ		1	1	1	2	2	2
Cyprinidae	<i>Cyclocheilichthys furcatus</i>	ປາໂຈກ		1	1	1	2	2	2
Clariidae	<i>Clarias macrocephalus</i>	ປາດຸກ		1	1	1			
Channidae	<i>Channa striata</i>	ປາຄໍ້		1	1	1			

Remarks:

The fish recorded during the village interviews have not been confirmed but based on the villagers perceptions.

**Plants observed in Ta Oy District -
Salavan Province**

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland; PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	General Use	Life form (eg tree, shrub, herb, vine etc)	Observed/ Interview	Lapeuang	Gang	Joravieng	Ten	Seunstamoong	Doub
Anacardiaceae	<i>Rhus succedanea</i>	Mai ket lin	wood for construction	tree	O	FF 3	FF 3	FF 3	FF3	FF 3	FF 3
Anacardiaceae	<i>Spondias pinnata</i>	Mai kok	edible fruits and medicine	tree	O	RF 3		FF3	FF 3		FF 2
Apocynaceae	<i>Alstonia scholaris</i>	Mai tin pet	bark for medicine	tree	O			BF, FF1	BF, FF 1	PF, BF, FF 3	FF 3
Apocynaceae	<i>Wrightia arborea</i>	Mai mouk	wood for construction	tree	O						FF 5
Bombacaceae	<i>Bombax ceiba</i>	Mai Ngieu	edible fruits	tree	O	RF 1					1 Plantation
Dipterocarpaceae	<i>Anisoptera costata</i>	mai bark	wood for construction	tree	O				BF, FF 4	PF, BF, FF 3	BF, FF 4
Dipterocarpaceae	<i>Dipterocarpus alatus</i>	Mai nhang khao	wood for construction	tree	O		PF 5	BF 3	BF 3	PF, BF, FF 2	FF 3

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Dipterocarpaceae	<i>Hopea odorata</i>	Mai khene	wood for construction	tree	O																BF, FF 3		
Dipterocarpaceae	<i>Vatica harmandii</i>	Mai si	resin	tree	O																PF 3		
Euphorbiaceae	<i>Phyllanthus embilica</i>	Mai khampom	firewood and edible fruits	small tree	O		BF, FF 5	FF 4	FF 3					PF, BF, FF 4								BF, FF 4	
Fabaceae	<i>Peltophorum dasyrhachis</i>	Mai sa fang	firewood	tree	O			FF 4	PF 3														
Fabaceae	<i>Sindora siamensis</i>	Mai te ho	wood for construction	tree	O		RF, FF 5	PF 2	FF 2		BF, FF 4			BF, FF 4									FF 2
Flacourtiaceae	<i>Casearia floranosa</i>	Mai pao	firewood	small tree	O		FF 3	FF3	FF3		FF 3			FF3									FF3
Graminae	<i>Bambusa tuldoies</i>	Mai phay po	edible shoot	shrub	O					FF 2				PF, RF, BF, FF 3									FF 3
Graminae	<i>Bambusa tulda</i>	Mai bong	edible shoot	shrub	O		RF, FF 5			PF, FF 4		BF, FF 4		PF, RF, BF, FF 5									FF 4
Graminae	??	Khem	grass for making brooms	herb	O					PF 4													
Graminae	<i>Gigantochloa apas</i>	Mai lay	edible shoot	shrub	O		PF	PF 5	FF 4		BF, FF 3			PF, BF, FF 5									FF 4
Graminae	<i>Indosasa sinica</i>	Mai khom	edible shoot		O				FF5														
Graminae	<i>Phyllostochys</i>	Mai phay ka sa	edible shoot	shrub	O		RF 3	PF 3	RF 3		BF, FF 4			PF, BF, FF 5									FF 4
Graminae	<i>Schizostachyum blumei</i>	Mai hia	edible shoot	shrub	O					FF 2		BF, FF 2		PF, RF, BF, FF 3									FF 2
Gramineae	<i>Oxytenantha parviflora</i>	Mai soot	edible shoot	shrub	O				PF5					PF, BF, FF 5									FF 4
Hypericaceae	<i>Cratoxylum formosum</i>	Mai tie	firewood	small tree	O		BF, FF 5	PF, FF 5	PF, BF, FF 5		BF, FF 5			PF, BF, FF 5									BF, FF 5
Irvingiaceae	<i>Irvingia malayana</i>	Mai bok	firewood	tree	O		FF 3	PF 2	FF3					PF, BF, FF 4									FF 4

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Leguminosae	<i>Acacia megdalena</i>	Nam khi het	firewood	shrub	O	BF, FF 2		BF 5		PF, BF, FF 5	BF, FF 4
Leguminosae	<i>Dalbergia cochinchinensis</i>	mai ka young	wood for contruction	tree	O			FF 2	FF2	PF, FF 2	FF 2
Leguminosae	<i>Dalbergia culrata</i>	Mai kam phi	wood for contruction	tree	O	FF 2	FF 2				
Leguminosae	<i>Peltaphorum desyrachis</i>	Mai sa fang	wood for contruction	tree	O			PF,FF 3	BF 3		FF 4
Lythraceae	<i>Lagestroemia balansae</i>	Mai puay	wood for contruction	small tree	O	RF 5	FF 5	PF, BF, FF5	BF, FF 4	PF, BF, FF 5	BF, FF 5
Meliaceae	<i>Azadirachta indica</i>	Mai ka dao	wood for contruction	tree	O				BF,FF 5		
Meliaceae	<i>Sandoricum koetjape</i>	mai tong	wood for contruction	tree	O			PF 2		PF, FF 2	PF, FF 2
Mimosoideae	<i>Albizia lebbeck</i>	Mai thoon	leaves for medicine	tree	O	FF 1	PF 4	PF, FF 3	BF, FF 4	PF 1	FF 1
Myrtaceae	<i>Syzygium cinereum</i>	Mai var	wood for contruction	tree	O	RF, FF 3	PF, FF 2	FF 4		PF, BF, FF 4	FF 4
Palmae	<i>Arenga westerhoutii</i>	Tao tat			O	FF 3	PF, FF 3	FF 3			
Palmae	<i>Calamus palustris</i>	Wai Nam hang	edible shoot	stem	O		PF 1				
Palmae	<i>Calamus viminalis</i>	wai ton	edible shoot	stem	O	RF, FF 5	RF,FF 5	PF, BF, FF 4	BF, FF 3	PF, BF, FF 4	FF 4
Palmae	<i>Calamus wailong</i>	Wai khaet	edible shoot	stem	O		PF 3				FF 2
Palmae	<i>Daemonoros jenkinsiana</i>	Wai boun	edible shoot	seedling	O			PF 4		PF, BF, FF 4	FF 2
Palmae	<i>Rhapis laoensis</i>	Saan	edible shoot	seedling	O	FF 1	PF 5	PF, FF 4	BF, FF 5	PF, BF, FF 5	FF 2

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Palmae	<i>Arenga westerhoutii</i>	Tao	edible shoot	stem	O						
Pandanaceae	<i>Pandanus</i>	Tuay	leaves for handicraft	shrub	O		PF 3	PF, FF 3		FF 3	FF 1
Phyllanthaceae	<i>Bischofia javanica</i>	Mai khaom fat	wood for construction, roots for medicine	medium tree	O			BF 1			
Proteacea	??	Mai mon			O					PF, BF, FF 4	
Pterocarpaceae	<i>Pterocarpus macrocapus</i>	Mai dou	wood for construction	medium tree	O	RF, BF, FF4	PF2	PF 4	BF, FF 4	PF, FF 2	FF3
Rutaceae	<i>Citrus reticulata</i>	Mai kieang	eating	tree	O			1 Plantation			
Rutaceae	<i>Zanthoxylum rhetsa</i>	Mai khean	eating	tree	O			BF 3	BF 3	BF 3	
Simaroubaceae	<i>Ailanthus triphysa</i>	Mai nhom pha	wood for construction	tree	O					PF 1	FF 1
Simaroubaceae	<i>Eurycoma harmandiana</i>	Hark ian dorn	roots for medicine	small shrub	O		PF 5	PF, BF, FF 4		FF 4	FF 4
Sterculiaceae	<i>Scaphium macropodium</i>	Mai chong	edible fruits	tree	O		PF 5				PA, PF, FF 5
Thymelaeaceae	<i>Aquilaria crassna</i>	Mai ketsana	black wood for resin	tree	O			1 Plantation			
Verbenaceae	<i>Gmelina arborea</i>	mai so	wood for construction and medicine	tree	O					PF 1	
Verbenaceae	<i>Tectona grandis</i>	mai sack	wood for construction, furniture	tree	O	FF1	FF 1	FF 1			
Zingiberaceae	<i>Alinia</i>	Kha pa	edible roots	herb	O		PF 5				

Zingiberaceae	<i>malaceaeisis</i> <i>Alpinia</i> <i>bracteata</i>	Kha khom	edible fruits	herb	O		PF 3				
Zingiberaceae	<i>Alpinia</i> <i>malacensis</i>	Kha nhai	edible roots	herb	O		PF 3				
Zingiberaceae	<i>Amomum</i> <i>xanthioides</i>	Mark neang	edible fruit	shrub	O			FF 4	FF 4	PF, RF, BF, FF 4	
Rubiaceae	<i>Anthocephalus</i> <i>chinensis</i>	Mai sako	wood for construction	tree	O	RF 3	PF3				
Leguminisae	<i>Dialium</i> <i>cochinchinansis</i>	Mai kheng	firewood	tree	O					FF 2	
Meliaceae	<i>Melia</i> <i>toosendan</i>	Mai hien	firewood	tree	O			FF 1	FF 1	FF 1	FF 1
Meliaceae	<i>Swietenia</i> <i>mahagoni</i>	mai ham ngoua	firewood	tree	O		FF 1	FF 1			
Leguminisae	<i>Dalbergia sp</i>	mai kacha	wood for construction	tree	O					PF, FF 3	FF 4
Symplocaceae	<i>Symplocos</i> <i>racemosa</i>	Mai muat	firewood		O			FF 5	FF 4		
Leguminoseae	<i>Ormosia</i> <i>cambodiana</i>	Mai khi mou	firewood	tree	O			FF 2		PF, FF 3	
Dipterocarpaceae	<i>Shorea</i> <i>siamensis</i>	Mai hang	wood for construction	tree	O		FF 5	FF3			
Anacardiaceae	<i>Anacardium</i> <i>occidentale</i>	Mai muouang	edible fruit and firewood	tree	O		1 Graden				
Lauraceae	<i>Schima wallichii</i>	Mai mee	edible fruitand wood for constuction	tree	O		1 Garden				
Leguminosae	<i>Tamarindus</i> <i>indica</i>	Mai kham	edible fruit and	tree	O		1 Garden	1 Garden	1 Garden		

		som	firewood					
Moraceae	Artocarpus lakoocha	Mai hat	edible bark	O	FF 2			
Compositae	Pluchea indica	Mai naat	firewood	O	FF 4			
Palmae	Rhapis spp.	Mai saan	leaf for packing	O	FF 3	FF 3	BF, FF 3	
Sterculiaceae	Pterospermum megalocarpum	mai ham oa	wood for construction	O	FF 4			
Datisceae	Tetrameles nudiflora	Mai phoung	wood for making a boat	O		BF 1	BF 1	
Barringtoniaceae	Careya sphalus	Mai ka don	edible young leaves	O		PF, FF 2		PF 3
Anacardiaceae	Anacardium occidentale	Mark Mouang he ma phan	edible fruit and young leaf	O		1 Plantation		
Gentianaceae	fagraea fragans	Mai man	wood for construction	O				FF 4
Chrysobalanaceae	Parinari anamensis	Mai phork	wood for construction	O				FF 2 FF 1
Bignoniaceae	Dolichandrone spathacea	Mai khea	edible flowers	O				FF 3

Remarks:

Habitat by village has been recorded
 Vatica harmandii is endangered (IUCN)

Annex 3.5 Samoa

Mammals recorded in Samoi District - Salavan Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland;
PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	Observed/ Interview	Habitat	Pin A	Ralang	Atuk	Lalai - Akong	Tangko	Achungleng	Lavatai	Achungray	Pin B
Elephantidea	Asian Elephant - <i>Elephas maximus</i>	ຊ້າງ	i	DSF						+			
Bovidae	Wild Water Buffalo - <i>Bubalus arnee</i>	ຄວາຍປ່າ	i	DPF, DSF						+			
Bovidae	Gaur - <i>Bos gaurus</i>	ເມີຍ - ກະທົງ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Ursidae	Asiatic Black Bear - <i>Ursus thibetanus</i>	ໝີ່ຄວາຍ (ໝີ່ດຳ)	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Felidae	Tiger - <i>Panthera tigris</i>	ເສືອໂຮ່ງ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Felidae	Leopard - <i>Panthera pardus</i>	ເສືອດາວ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Felidae	Clouded Leopard - <i>Pardofelis marmorata</i>	ເສືອຕະກູດ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Felidae	Marble cat - <i>Felis marmorat</i>	ເສືອແມວລາຍຫີນ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Felidae	Fishing Cat - <i>Prionailurus bengalensis</i>	ເສືອແມວກິນປາ	o, i	DPF, DSF	+	+	+	+	+	+	+	+	+
Bovidae	Saola - <i>Pseudonovibos spiralis</i>	ເສືອຫລາ	i	DPF, DSF							+		
Bovidae	Southern Serow - <i>Naemohedus sumatrensis</i>	ເຍືອງ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Cercopithecidae	Douc Langur - <i>Pygathrix nemaeus</i>	ຂາແດງ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Hylobatidae	Gibbon Species - <i>Hylobates leucogenys/gabrielae</i> sp.	ທະນີ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Cervidae	Sambar Deer - <i>Cervus unicolor</i>	ກວາງ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Cervidae	Roosevelts' Muntjac - <i>Muntiacus rooseveltorum</i>	ຟານດົງ	l,o	DPF, DSF	+	+	+	+	+	+	+	+	+
Pteromyidae	Giant Flying Squirrel - <i>Ratufa bicola</i>	ປ່າງລື້ວ	i	DPF, DSF, FA	+	+	+	+	+	+	+	+	+

Mustelidae	Otter - <i>Lutra sp.</i>	ນາກນ້ຳ	i	RB	+	+	+	+	+	+	+	+	+
Manidae	Pangolin - <i>Manis javanicus</i>	ລິ້ນ	i	DPF, DSF			+			+			+
Loridae	Slow Loris Species - <i>Nycticebus sp.</i>	ລິງລົມ	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Canidae	Golden Jackal - <i>Canis aureus</i>	ໝາຈອກ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Canidae	Dhole - <i>Cuon alpinus</i>	ໝາໄນ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Viverridae	Large Spotted Civet - <i>Viverra megaspila</i>	ເຫງິນຫາງກ່ານ	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Viverridae	Owston's Palm Civet - <i>Hemigalus owstoni</i>	ເຫງິນລາຍພາດກ ອນ	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Viverridae	Spotted Linsang - <i>Prionodon pardicolor</i>	ເຫງິນຫາງປ້ອງ	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Viverridae	Masked Palm Civet - <i>Paguma larvata</i>	ເຫງິນຫາງຂໍ	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Viverridae	Common Palm Civet - <i>Paradoxurus sp.</i>	ເຫງິນອີ້ມ	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Cervidae	Red Muntjac - <i>Muntiacus muntjac</i>	ຟານເລົ່າ	o, i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Tragulidae	Lesser Mouse Deer - <i>Tragulid javanicus</i>	ໄກ້	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Mustelidae	Hog-Nosed Badger - <i>Arctonyx collaris</i>	ໝູ່ລິ້ງ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Hystricidae	Brush-tailed Porcupine - <i>Atherurus macrourus</i>	ຫອນ	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Hystricidae	Porcupine - <i>Hystrix brachyura</i>	ເໝັນ	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Cercopithecidae	Monkeys - <i>Macaca sp.</i>	ລິງ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Sciuridae	Black Giant Squirrel - <i>Ratufa bicolor</i>	ກະຮອກໝີ່	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Spalacidae	Large Bamboo Rat - <i>Rhizomys sumatrensis</i>	ອີ້ນ ໃຫຍ່	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Suidae	Common wild pig - <i>Sus scrofa</i>	ໝູ່ປ່າ	o, i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Sciuridae	Pallars's Squirrel - <i>Callosciurus erythraeus</i>	ກະຮອກທອງແດງ	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Sciuridae	Irrawaddy Squirrel - <i>Callosciurus pygerythrus</i>	ກະເລນ	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+

Sciuridae	Berdmore's Squirrel - <i>Menetes bermorei</i>	ກະຈ້ອນ	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+
Pteromyidae	Black Flying Squirrel - <i>Aeromys tephromelas</i>	ປ່າງຫຼຸດຈຳ	i	DPF, DSF,FA	+	+	+	+	+	+	+	+	+

Remarks:

The mammal species recorded during the interviews have not been confirmed but on the villagers perceptions.

During the interview visual aids “pictures” of animals were used which helped identify a species and make better in data gathering process across all the participating villages.

Observed species included:

Fishing cat, Common wild pig and Red Muntjac were seen their tracks nearly the sacred forest site of Ban Achungleng with evidences of used ponds and nest materials found. Also, saw horns of Roosevelts' Muntjac at restaurant in Samoi district (photo)

Birds recorded in Samoi District - Salavan Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland;
PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	Observed/ Interview	Habitat	Pin A	Ralang	Atuk	Lalai - Akong	Tangko	Achun gleng	Lava tai	Achun g Yai	Pin B
Phasianidae	Green Peafowl - <i>Pavo muticus</i>	Nok Yong	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Bucerotidae	Great Hornbill - <i>Buceros bicornis</i>	ນົກ ກົກຄໍຄຳ	l,o	DPF, DSF		+	+	+	+	+	+	+	+
Bucerotidae	Rufous-necked Hornbill - <i>Aceros nipalensis</i>	ນົກ ກົກຄໍແດງ	i	DPF, DSF		+	+	+	+	+	+	+	+
Bucerotidae	Wreathed Hornbill - <i>Aceros undulates</i>	ນົກ ກົກຄໍເອີມ	i	DPF, DSF		+	+	+	+	+	+	+	+
Phasianidae	Crested Argus - <i>Rheinardia ocellata</i>	ນົກລູ່ວ່າວ (ນົກ ຍຸງທອງ)	i	DPF, DSF		+	+	+	+	+	+	+	+
Anatidae	White-winged Duck - <i>Cairina scutulata</i>	ນົກເປັດກ່າ	i	DPF, DSF		+	+	+	+	+	+	+	+
Ciconiidae	Painted Stork - <i>Mycteria leucocephala</i>	ນົກກາຍບົວ	i	DPF, DSF		+	+	+	+	+	+	+	+
Threskiornithidae	Giant Ibis - <i>Pseudibis gigantea</i>	ນົກອູ້ມລົວ	i	DPF, DSF		+	+	+	+	+	+	+	+
Phasianidae	Siamese Fireback - <i>Lophura diardi</i>	ໄກ່ຂວານົນ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Phasianidae	Grey Peacock-Pheasant - <i>Polyplectron bicalcaratum</i>	ນົກ ກາງກອດ	i	DPF, DSF		+	+	+	+	+	+	+	+
Ciconiidae	Woolly-necked Stork - <i>Ciconia episcopus</i>	ນົກຄໍກ່ານ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Ciconiidae	Adjutants - <i>Leptoptilos sp.</i>	ນົກກະຊຸມ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Threskiornithidae	Black-headed Ibis - <i>Threskiomis melanocephalus</i>	ນົກ ສ້ອນ ຫອຍຫົວດຳ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Strigidae	Spot-bellied Eagle Owl - <i>Bubo nipalensis</i>	ນົກ ເຄົ້າ (ນົກ ທິດທໍ້ໃຫຍ່)	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+

Rallidae	Purple Swamphen - <i>Porphyrio porphyrio</i>	ນົກເທບ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Picidae	Red-collared Woodpecker - <i>Picus rabieri</i>	ນົກໄຊ້ຄໍແດງ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Falconidae	Imperial Eagle - <i>Aquila heliaca</i>	ແຫລວປານ້ອຍ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Columbidae	Green Imperial Pigeons - <i>Ducula aenea</i>	ນົກ ມູມຫິ່ງ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
	Tern - <i>Sterna sp.</i>	ນົກ ສີດາ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Ciconiidae	Black-necked Stork - <i>Ephippiorhynchus asiaticus</i>	ນົກ ກະສາຄໍດຳ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Anatidae	Masked Finfoot - <i>Heliopais personata</i>	ນົກ ເປັດຫນ້າ ດຳ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Burhinidae	Great Thick-knee - <i>Esacus recurvirostris</i>	ນົກ ກະແຕ້	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Accipitridae	Brahminy Kite - <i>Haliastur Indus</i>	ແຫລວຫົວຂາວ ໂຕແດງ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Phasianidae	Little Cormorant - <i>Phalacrocorax niger</i>	ນົກ ການ້ຳນ້ອຍ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Anatidae	Cotton pygmy-Goose - <i>Nettapus coromandelianus</i>	ນົກ ເປັດປ່ອງ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Charadriidae	River Lapwing - <i>Vanellus duvaucelii</i>	ນົກ ກະແຕ້ ຫ້ວຍ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Accipitridae	Lesser Fish Eagle- <i>Ichthyophaga humilis</i>	ແຫລວປາຫົວ ໝິ່ນນ້ອຍ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Accipitridae	Grey-headed Fish Eagle - <i>Ichthyophaga ichthyaetus</i>	ແຫລວປາຫົວ ໝິ່ນໃຫຍ່	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Passeridae	Asian Golden Weaver - <i>Ploceus hypoxanthus</i>	ນົກ ກະຈາບຄຳ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Psittacidae	Red Breasted Parakeet - <i>Psittacula alexandri</i>	ນົກແຂກ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Centropodidae	Greater Coucal - <i>Centropus sinensis</i>	ນົກ ກົດປັດ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+

Picidae	Hoopoe - <i>Upupa epops</i>	ນົກໄຊ້ (ນົກ ຫອນຂວານ)	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Bucerotidae	Oriental Pied Hornbill - <i>Anthracoeros albirostris</i>	ນົກແກງ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Bucerotidae	Brown Hornbill - <i>Anorrhinus tickelli</i>	ນົກ ໝານ້ອຍ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Sturnidae	Hill Myna - <i>Gracula religiosa</i>	ນົກສາລິກາ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Picidae	Wood-pecker - <i>Picus sp.</i>	ນົກຫົວຂວານ (ນົກສະໄລ)	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Psittacidae	Parakeets Species - <i>Psittacula sp.</i>	ນົກແກ້ວ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Anatidae	Garganey - <i>Anas querquedula</i>	ນົກເປັດລາຍ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Columbidae	Reb Collared Dove - <i>Streptopelia tranquebarica</i>	ນົກເຂົາທອງ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Ardeidae	Purple Heron - <i>Ardea purpurea</i>	ນົກກະສາແດງ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Strigidae	Owls - <i>Asio, Otus, Glaucidium, Athene, Ninox, Ketupa, Strix sp.</i>	ນົກເຄົ້າ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Charadriidae	Rea-wattled Lapwing - <i>Vanellus indicus</i>	ນົກກະແຕ້ ແວ້ ດ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Sturnidae	Common Myna - <i>Acridotheres tristis</i>	ນົກອັງໂມ່ງ	o, i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Cuculidae	Asian Koel - <i>Eudynamys scolopacea</i>	ນົກກະເຫວົ້າ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Alcedinidae	Common King fisher - <i>Alcedo atthis</i>	ນົກເຕັນຊິວ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Megalaimidae	Great Berbet - <i>Magalaima virens</i>	ນົກ ຕັງລໍ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Columbidae	Spotted Dove - <i>Streptopelia chinensis</i>	ນົກເຂົາຂັນ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Columbidae	Pale-capped Pigeon - <i>Columba punicea</i>	ນົກ ເຂົາ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Rallidae	Watercock - <i>Gallicrex cinerea</i>	ນົກ ຕູມ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Columbidae	Green Pigeons - <i>Treron sp.</i>	ນົກ ເປົ້າ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+

Falconidae	Changeable hawk Eagle - <i>Spizaetus cirrhatus</i>	ແຫລວມູມ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Ardeidae	Egrets - <i>Egretta sp.</i>	ນົກຍາງ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Psittacidae	Parakeets - <i>Psittacula sp.</i>	ນົກກ່າງ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Pittidae	Pittas - <i>Pitta sp.</i>	ນົກແຕວແລວ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Phasianidae	Red Junglefowl - <i>Gallus gallus</i>	ໄກ່ປ່າ	o,i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Corvidae	Drongo Species - <i>Dicrurus sp.</i>	ນົກແຂວ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Phasianidae	Scaly-breasted Partridge - <i>Arborophila chloropus</i>	ນົກກະທາ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Turnicidae	Barred Buttonquail - <i>Tumix suscitator</i>	ນົກຊຸ້ມ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Rallidae	White Breasted Waterhen - <i>Amauromis phoenicurus</i>	ນົກໄກ່ນາ	i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+
Corvidae	Large-billed Crow - <i>Corvus macrohynchos</i>	ກາ	o, i	DPF, DSF,FA,	+	+	+	+	+	+	+	+	+

Remarks:

The bird species recorded during the village interviews have not been confirmed but based on the villagers perceptions.

Observed species included:

Red Junglefowl and Large-billed Crows which their tracks were observed close to the sacred forest site of Ban Achungleng.

A head of the Great Hornbill - *Buceros bicornis* was once observed at a restaurant in Samoi district (photo)

Amphibians & Reptiles recorded in Samoi District - Salavan Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland; PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	Observed/ Interview	Habit at	Phin A	Ralan g	Atuk	Lalai-Akong	Tang ko	Achungleng	Lava tai	Achung Yai	Phin B
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Amphibians

Bufo	Toad - <i>Kaloula mediolineata</i>	ອີງ	i	DSF, RB	+	+	+	+	+	+	+	+	+
Rana	Frog- <i>Rana limnocharis</i>	ກົບ	i	DSF, RB	+	+	+	+	+	+	+	+	+
Rana	Common Lowland Frog- <i>Rana sp.</i>	ຊູດ	i	DSF, RB	+	+	+	+	+	+	+	+	+
Bufo	True toads - <i>Bufo sp.</i>	ຄັນຄາກ	i	DSF, RB	+	+	+	+	+	+	+	+	+
Reptiles													
Emydoidea	Big headed Turtle - <i>Platysternon megacephalum</i>	ເຕົ້າກຸຍ (ປູລູ)	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Emydoidea	Elongated turtle - <i>Indotestudo elongata</i>	ເຕົ້າ ຜັກ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Emydoidea	- <i>Xenochrophis flaviunctata</i>	ເຕົ້າ ນາ	i	RB	+				+	+	+	+	+
Dasydotele	Soft-shell turtle- <i>Amyda sp.</i>	ປາຝາອອງ	i	RB	+	+	+	+	+	+	+	+	+
Elapidae	King cobra - <i>Ophiophagus hannah</i>	ງູຈີງອາງ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Boidae	Reticulated Python - <i>Python reticulates</i>	ງູເຫລືອມ	i	DPF, DSF	+	+	+	+	+	+	+	+	+
Elapidae	Cobra species - <i>Naja sp.</i>	ງູເຫ້າ	i	DPF, DSF, F, A	+	+	+	+	+	+	+	+	+
Colubridae	Indo-chinesees Rat Snake - <i>Zamenis sp.</i>	ງູສິງດິງ	i	DPF, DSF, F, A	+	+	+	+	+	+	+	+	+
Colubridae	Radiated Ratsnake - <i>Elaphe radiata</i>	ງູສາ	i	DPF, DSF, F, A	+	+	+	+	+	+	+	+	+
Colubridae	White-bellied Rat Snake Rhabdophis sp.	ງູດາງແຫ	i	DPF, DSF, F, A, RB	+	+	+	+	+	+	+	+	+
Varanidae	Bangal Monitor - <i>Varanus bengalensis</i>	ແລນ	i	DPF, DSF, F, A	+	+	+	+	+	+	+	+	+
Varanidae	Water monitor - <i>Varanus salvator</i>	ເຫ້ຍ	i	DPF, RB	+	+	+	+	+	+	+	+	+

Agamidae	Water Dragon - <i>Pysignathus cocincinus</i>	ກະທ້າງ	i	DPF, DSF, R, B	+	+	+	+	+	+	+	+	+
Gekkonidae	Gekko Species - <i>Gekkonidae sp.</i>	ກັບແກ້	i	DPF, DSF, F, A	+	+	+	+	+	+	+	+	+
Uromastixidae	Common Butterfly Lizard - <i>Leiolepis sp.</i>	ແຍ້	i	G	+	+	+	+	+	+	+	+	+
Agamidae	Forest Crested Lizard - <i>Calotes emma sp.</i>	ກະປອມ	i	DPF, DSF, FA, G	+	+	+	+	+	+	+	+	+
Scincidae	Many-line Sunskink - <i>Mabuya multifasciata</i>	ສິໂນະ	i	DPF, DSF, FA, G	+	+	+	+	+	+	+	+	+

Remarks:

The amphibian and reptile species recorded during the village interviews have not been confirmed but based on the villagers perceptions.

Freshwater fish recorded in Samoi District - Salavan Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland;

PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	Observed/ Interview	Habitat	Pin A	Ralan g	Atuk	Lalai- Akong	Tang ko	Achun gleng	Lava tai	Achung Yai	Pin B
Akysidae	<i>Mystus microphthalmus</i>	ປາເຄີງ	i	RB, Xepond	+					+	+	+	
Cyprinidae	<i>Poropuntius sp.</i>	ປາຈາດ	i,0	RB, Xepond	+					+	+	+	
Synbranchidae	<i>Monopterus albus</i>	ອ່ຽນ	i	RB, Xepond, Houay DSF	+	+	+	+	+	+	+	+	+
Clariidae	<i>Clarias macrocephalus</i>	ປາຕຸກ	i	RB, Xepond, Houay DSF	+	+	+	+	+	+	+	+	+
Channidae	<i>Channa striata</i>	ປາຄໍ້	i	RB, Xepond, Houay DSF	+	+	+	+	+	+	+	+	+
Cyprinidae	<i>Hampala macroledota</i>	ປາສູດ	i	RB, Xepond, Houay DSF		+	+	+	+	+	+	+	+
Cyprinidae	<i>Lobocheilus</i>	ປາຄຽງ	i	RB, Xepond, Houay DSF				+	+	+	+	+	+
Mastacembelidae	<i>Mastacembelus favus</i>	ປາຫລາດ	i	RB, Xepond, Houay DSF	+	+	+	+	+	+	+	+	+
Mastacembelidae	<i>Macrogathus sp.</i>	ປາຫລິດ	i	RB, Xepond, Houay DSF		+	+	+	+	+	+	+	+
Channidae	<i>Channa gachua</i>	ປາກໍ້ງ	i	RB, Xepond, Houay DSF	+	+	+	+	+	+	+	+	+
Pangasidae	<i>Pangasius sp.</i>	ປາຫົວນ່ວນ	i	RB, Xepond, Houay DSF					+	+	+	+	+
Cyprinidae	<i>Systemus aurotaeniatus</i>	ປາຂາວ	i	RB, Xepond, Houay DSF	+	+	+	+	+	+	+	+	+
Cyprinidae	<i>Rasbora sp.</i>	ປາຊິວ	i	RB, Xepond, Houay DSF	+	+	+	+	+	+	+	+	+

Remarks:

The fish recorded during the village interviews have not been confirmed but based on the villagers perceptions.

Visual aids were used to identify a species and that make better in data gathering process across all the villages

Observed species include:

Poropuntius sp. was observed a boy selling it at a guesthouse.

Plants observed in Samoi District - Salavan Province

(Habitats: HG - Home Gardens; DPF - Dense Primary Forest; DSF - Degraded Secondary Forest; FA - Fallow Scrubland;
PF - Paddy Fields; G - Grasslands; RB - River Bank)

Family	Common & Scientific Name	Lao Name	General Use	Life form	Observed/ Interview	Habitat	Pin A	Ralang	Atuk	Lalai-Akong	Tangko	Acnungleng	Lavatai	Acnung Yai	Pin B
Anacardiaceae	<i>Spondias pinnata</i>	Mai kok	edible fruits and wood for house construction	tree	o, i	DSF, FA, RB	+	+	+	+	+	+	+	+	+
Apocynaceae	<i>Wrightia arborea</i>	Mai mouk	Using this specie for growing peper (pigtahi)	tree	o, i	DPF, DSF, FA,		+	+	+	+	+	+	+	+
Bombacaceae	<i>Bombusa tulda</i>	Mai bong	bamboo cane for house construction	tree	o, i	HG, DPF, DSF, FA, RB	+	+	+	+	+	+	+	+	+
Dioscreaceae	<i>Cassava</i>	Man Tohn	supplementary to rice during the shortage	crop	o, i	HG, FA,	+	+	+	+	+	+	+	+	+
Dipterocarpaceae	<i>Hopea odorata</i>	Mai khene hin	using sawn wood for floor	tree	o, i	DPF, DSF, FA	+	+	+	+	+	+	+	+	+
Euphorbiaceae	<i>Phyllanthus embrica</i>	Mark khampom	edible fruits and wood for house construction	shrub	o, i	HG,DSF , FA					+	+	+		
Fagaceae	<i>Lithocarpus hemisphaericus</i>	Mai hai	firewood	small tree	o, i	DPF, DSF, FA	+	+	+	+	+	+	+	+	+
Flacourtiaceae	<i>Casearia floranos</i>	Mai poa	firewood	small tree	o, i	DPF, DSF, FA	+	+	+	+	+	+	+	+	+
Graminae	<i>Bambusa tulda</i>	Mai Bong	edible shoots (bamboo) and cane for house construction	shrub	o, i	HG, DPF, DSF,	+	+	+	+	+	+	+	+	+

Graminae	<i>Broom grass</i>	Keam	making brooms	herb	o, i	FA, RB DPF, DSF	+	+	+	+	+	+	+	+	+	+
Graminae	<i>Dendrocalamus lonoifimbriatus</i>	Mai Phang	edible shoots (bamboo) and cane for house construction	shrub	o, i	HG, DPF, DSF, FA, RB	+	+	+	+	+	+	+	+	+	+
Graminae	<i>Gigantochloa apas</i>	Mai Lai	edible shoots (bamboo) and cane for house construction	shrub	o, i	HG, DPF, DSF, FA, RB	+	+	+	+	+	+	+	+	+	+
Gramineae	<i>Oxytenantha parviflora</i>	Mai soth	edible shoots (bamboo) and cane for house construction	shrub	o, i	HG, DPF, DSF, FA, RB	+	+	+	+	+	+	+	+	+	+
Gramnae	<i>Dendrocalamus Brendisii</i>	Mai Xangpai	edible shoots (bamboo) and cane for house construction	shrub	o, i	HG, DPF, DSF, FA, RB						+	+	+	+	+
Hypericaceae	<i>Cratoxylum formosum</i>	Mai Tei	firewood	small tree	o,i	HG, DPF, DSF, FA	+	+	+	+	+	+	+	+	+	+
Leguminosae	<i>Dalbegia cochinchinensis</i>	Mai Kha nhoung	high value wood for house construction (endangered species)	tree	o,i	HG, DPF, DSF, FA						+	+	+	+	+
Leguminosae	<i>Senna siamea</i>	Khi Lek	firewood	tree	o, i	HG, DPF, DSF, FA, RB	+	+	+	+	+	+	+	+	+	+
Leguminosae	<i>Dalbegia spp</i>	Mai Kacha	wood high quality for export	tree	o, i	DPF							+		+	+
Lythraceae	<i>Lagestroemia blansae</i>	Mai Beuai	use sawn wood for floor and small pieces for roofs	tree	o, i	HG, DPF, DSF, FA	+	+	+	+	+	+	+	+	+	+
Magnliaceae	<i>Paramichelia baillonii</i>	Champa Pa	house construction	tree	o, i	DPF, DSF			+	+	+	+	+	+	+	+
Meliaceae	<i>Azadirachta</i>	Mai	house construction	tree	o, i	DPF, DSF, FA							+	+		

	<i>indica</i>	DoanKadoan															
Meliaceae	<i>Sandoricum koetjape</i>	Mark Tong	edible fruits and wood for house construction	tree	o, i	HG, DSF, FA	+	+									
Myrtaceae	<i>Syzygium cinereum</i>	Mai Vah	house construction	tree	o, i	DSF			+	+	+	+	+	+	+		
Palmae	<i>Arenga westerhoutii</i>	Tohn Tane	edible shoots (bamboo)	seedling	o, i	FA,			+	+	+	+	+	+	+	+	+
Palmae	<i>Daemonorops jenkinsiana</i>	Wai Boun	edible shoot and cane for construction	seedling	o, i	DPF, DSF, FA,	+	+	+	+	+	+	+	+	+	+	+
Palmae	<i>Rhapis laoensis</i>	Sane	edible shoot	seedling	o, i	DPF, DSF, FA,	+	+	+	+	+	+	+	+	+	+	+
Pinaceae	<i>Keteleeria evelyniana</i>	Mai Hing	house construction	tree	o, i	DPF, DSF					+	+	+	+	+	+	+
Pinaceae	<i>Pinus kesiya</i>	Mai peak sam nhot (three needle)	house construction	tree	i	DPF, DSF							+			+	
Pterocarpaceae	<i>Pterocarpus macrocapus</i>	Mai Dou	hard wood with high value for house construction	medium tree	o, i	HG, DPF, DSF, FA, RB	+	+	+	+	+	+	+	+	+	+	+
Verbenaceae	<i>Gmelina arborea</i>		house construction	tree	o, i	FA								+	+		
Zingiberaceae	<i>Alpinia malaccaensis</i>	Kha pa	edible roots	herb	o, i	DPF, DSF, FA	+	+	+	+	+	+	+	+			
Lauraceae	<i>Schima wallichii</i>	Mai mee	edible fruits and wood for house construction	tree	o, i	HG	+	+	+	+	+	+	+	+	+	+	+
Symplocaceae	<i>Symplocos racemosa</i>	Mai meuat	firewood		o, i	HG, DPF, DSF, FA, RB											+
Rutaceae	<i>Cinamomum litsefolium</i>	Mai kinut (Mai Chouang)	oil using for massage (high demand for export)		o, i	DPF, DSF	+	+	+	+	+	+	+	+	+	+	+
Gramineae	<i>Imperata cylindrica</i>	Nha ka	grasses for making roof sheets for houses		o, i	DPF, DSF				+	+	+	+	+	+	+	+
Rubiaceae	<i>Musa acuminata</i>	Kuay pa	edible flowers	wild	o, i	DPF, DSF				+	+	+	+	+	+	+	+

Ficus	<i>Species generally</i>	Mai hay	fruits for animal feeding	flower stem	o, i	DPF, DSF, FA	+	+	+	+	+	+	+
Passifloraceae	<i>Passiflora foetidel</i>	Phak bouang	edible leaves	vine	o, i	RB	+	+	+	+	+	+	+
Graminae	<i>Erianthus arundinacea</i>	Nha Lao	flowers for pillows		o, i	DPF, DSF, FA, R				+	+	+	+
leguminosae-papilionatae	<i>Sesbania grandiflorta</i>	Khea khao, khae dor	edible flowers	small tree	o, i	DPF, DSF, FA,				+	+	+	+
Ebenaceae	<i>Diospyros glandulosa</i>	Kea hom	fruits for export to Vietnamese	small tree	o, i	HG					+	+	+
Pterydophyta-Cyatheaceae	<i>Cyathia (fern spp)</i>	Phak kout	edible ferns	small tree	o, i	HG, DPF, DSF, FA, RB					+	+	+
Myrtaceae	<i>Eugenia zeylanica</i>	Phark sa mek	edible leaves and use for medicine	small tree	o, i	HG, DPF, DSF, FA, RB					+	+	+

Remarks:

Pinus kesiya is listed on IUCN redlist as lower risk

Annex 4: Consolidated Secondary Species Lists

No.	Reference details	Study areas and habitat descriptions	Comments
B14	Crome, F., Richards, S., Phengsintham, P. & Somvonasa, C. (2001). Biodiversity and conservation assessment of the Sepon project area, Report to Lane Xang Minerals, March 15, Francis Crome Pty Ltd.	Study conducted in Sepon Mine concession area: <ul style="list-style-type: none"> • Nalou - Agricultural land, Medium 8-15yr Fallow • Nam Kok West - Agricultural land, Young 1-7 yr Fallow and Medium 8-15 yr Fallow • Nam Kok East - Fallow and Medium 8-15 yr Fallow and Old Fallow • Discovery - Bamboo Forest, Medium 8-15 yr Fallow • Discovery West - Bamboo Forest, Medium 8-15 yr Fallow • Khanong - Fallow Forest, Bamboo Forest, Mixed Deciduous • Phou Thengkham - Evergreen Forest, Mixed Deciduous, Old Fallow 	<p>This study is one of the few studies conducted outside protected areas.</p> <p>Plant list is extensive. Have scanned this.</p>
B10	Boonratana, R. (1998), Protected Areas Field Management in Nam Poui and Pho Xang He NBCAs: A presentation by Dr Boonratana, IUCN, Vientiane.	Field management guide to Phou Xang He. Species lists do not include specific habitat types.	Lists are very limited and general.
B20	Duckworth, J.W., R.J. Timmins & K. Cozza (1993). A Wildlife and Habitat Survey of Phou Xang He Proposed Protected Area, Unpublished.	<p>Study conducted in Phou Xang He Protected Area:</p> <ul style="list-style-type: none"> • Phou Xang He – large sandstone plateau dominated by mixed deciduous forest and to a lesser extent, dry dipterocarp on the steepest/rockiest terrain and semi evergreen where soil is better. • Phou Hinho – Lower slopes, valleys and ridges are dominated by evergreen forest which does not occur on Phou Xang He. To the south east the forest is semi evergreen and mixed deciduous. • Corridor – Lowland corridor of gently rolling landscape forming the Xe Thamouak catchment and consisting of mosaic landscapes. <p>Habitats include:</p> <ul style="list-style-type: none"> • Evergreen and Semi Evergreen Forest - Phou Hinho, 	Habitat split has been done.

		<p>Phou Xang He, Corridor.</p> <ul style="list-style-type: none"> • Forest – Mixed deciduous; Dry Dipterocarp • Degraded Landscapes – cultivation; scrub 	
B27	<p>Hanson, K.K., Jeppesen, T. (2004), Non Timber Forest Products and Rural Livelihoods: a case study on local management and marketing of non timber forest products in two NPAs, Savannakhet Province, Lao PDR, Unpublished.</p>	<p>NTFPs study conducted in Dong Phou Vieng and Phou Xang He Protected area. Two forest types surveyed including:</p> <ul style="list-style-type: none"> • Open Forest - Dry dipterocarp and Fallow forest with fast regeneration. (areas effected by shifting cultivation) • Thick Forest - Evergreen forest <p>Forest type not detailed in species lists</p>	<p>List does not include family names. Only includes lao names for many. Forest type not detailed in species lists</p> <p>Uses of NTFPs was not recorded by the data entry person so I have decided to scan.</p>
B33	<p>Ounekham, K. & Inthapatha, S (2003), Important Bird Areas in Lao PDR, Vientiane: Department of Forestry, BirdLife International in Indochina, Wildlife Conservation Society Lao Program, Sisavath Printing Press, Vientiane, Lao PDR.</p>	<p>Important Bird Areas in the study area including:</p> <ul style="list-style-type: none"> • Dackchung Plateau - is extensively degraded and vegetation is dominated by pine wood and grassland with patches of degraded semi evergreen forest and dry evergreen forest and patches of marshy land. • Phou Ahyon – Largest and highest mountain in southern Laos dominated by dry evergreen forest with Fokiena forest above 1500m and upper montane forest above 1800m. Lower elevations have been extensively cleared for agriculture. • Xe Sap PA – extensively forested and vegetation is dominated by dry evergreen forest, with smaller areas of pine forest and at lover elevations, semi evergreen forest. Elevations above 1800m may support montane forest. There are also some areas of grassland. 	
B45	<p>Showler, D.A. & P. Davidson. (1998). A wildlife and habitat survey of the southern border of Xe Sap NBCA and the Dakchung Plateau, Xe Kong Province, Lao PDR. Wildlife Conservation Society, Lao PDR.</p>	<p>Wildlife and habitat survey of Xe Sap Protected Area including:</p> <ul style="list-style-type: none"> • Southern boarder of Xe Sap (altitude (180m-1265m)) <ul style="list-style-type: none"> ○ Dense Srub and Bamboo Forest (less than 20 yrs old) ○ Patches of Evergreen Forest (approx 1km2) 	

		<ul style="list-style-type: none"> ○ Degraded Evergreen Forest on hilltops ○ Pine woodlands ○ Grassland (1km²) ○ Degraded riverine forest along Xekong River <ul style="list-style-type: none"> ● Dakchung Plateau (altitude 1000m-1200m) <ul style="list-style-type: none"> ○ Grass land ○ Secondary scrub ○ Pine woodland ○ Degraded semi –evergreen ○ Degraded Evergreen forest ○ Marshland 	
B46	Steinmetz, R., T. Stones & T. Chan-Ard (1999). An ecological survey of habitats, wildlife, and people in Xe Sap NBCA, Salavan Province Lao PDR. WWF Thailand Programme Office, Lao PDR.	<p>Survey areas include the mountainous areas of Phou Glem, Phou Abourl, Phou Leng and Phou Ma Nai. Habits include;</p> <ul style="list-style-type: none"> ● Hill evergreen forest ● Pine Forest ● Semi Evergreen Forest 	While lists do sperate species recorded in these specific areas, this has not been recorded in the secondary data list.
B47	Timmins, R.J., & C. Vongkhambeng (1996). A preliminary wildlife and habitat survey of Xe Sap NBCA and mountains to the South, Salavan Province, Lao PDR.	<p>Study habitats include:</p> <ul style="list-style-type: none"> ● Phou Ajol – Mossy Forest, Fokienia Forest and Evergreen forest ● Ban Ayun – Degraded evergreen forest ● Ban Dakchung – pine forest with grassland ● Dakchung Plateau – degraded non forest habitats ● Ban Somoy (headwaters of Sepon river) – secondary growth in lower valleys and slopes, evergreen forest in higher tributary valleys, slopes and ridges. ● Ban Samoy (tributary to Xe Sap) – secondary growth in lower valleys and slopes, evergreen forest in higher tributary valleys, slopes and ridges. ● East of Ban Dachung – Predominantly secondary growth ● Kaleum (Xe Kong) – predominantly secondary growth 	<p>Bird species.</p> <p>Habitat split has been recorded.</p>

		Habitat classes split <ul style="list-style-type: none"> • Mossy Forest, Fokienia Forest • Evergreen forest • Secondary vegetation • Pine Forest 	
B51	World Wildlife Fund (1998), Dong Phu Vieng NBCA Rapid & Participatory Biodiversity Assessment (BIORAP) Final Report, Forest Management & Conservation Program National Biodiversity Conservation Areas Sub-Program, Burapha Development Consultants, Lao PDR.	Dong Phou Vieng has extensive water resources ranging from lowland water bodies including the Xe Bang Hiang River and upland bodies such as the Houay Palouang. These habitats differ from each other substantially.	Only fish species listed in secondary lists.

Annex 4.1: Mammals

Family Name	Scientific Name	Lao Name	Conservation Status - IUCN Redlist	USE	Savannakhet			Salavan		Source
					PXH	DPV	Non-PA	XS	Non-PA	
Rhamnaceae	<i>Diospiros sp.</i>	Nam lep meo		Edible fruit			x			B14
Malvaceae	<i>Abelmoschus moschatus Medicus</i>	Ta ven paa		Medicinal plant			x			B14
Papilionoideae	<i>Abrus punchellum Wall, ex Thw</i>	Kham kua		Medicinal Plant			x			B14
Mimosoideae	<i>Acacia concinna (Willd.) A.DC</i>	Sompoy		Medicinal Plant, and the fruit can			x			B14
Mimosoideae	<i>Acacia farnesiana (Linn.) Willd</i>	Kham thed		The young leaves can be eaten raw or cooked			x			B14
Mimosoideae	<i>Acacia magalagena Desv.</i>	Nam han		Poisonou plant			x			B14
Leguminosae	<i>Acacia pennata</i>	Phak Nao		Food	x					B27
Amaranthaceae	<i>Achyranthes bedentata BL.</i>	Nhakhouyngu		Medicinal plant			x			B14
Araceae	<i>Acorus tatinowi Schott.</i>	Phak paen nam		Medicinal plant			x			B14
Pteridoideae	<i>Acrostictium aureum L.</i>	-		Decorative fern			x			B14
Papilionoideae	<i>Adenanther pavonina L.</i>	Sathon		stem used for firewood and fence making			x			B14
Papilionoideae	<i>Adenanthera parvonina var. microsperma</i>	Lurn ta kai		stem used for firewood and fence			x			B14

				making					
Adiantaceae	<i>Adiantum caudatum L.</i>	Phak kud		Decorative fern			x		B14
Amaranthaceae	<i>Aevera sanguinolenta (L.) BL.</i>	Sanhakhouyngou		Medicinal plant			x		B14
Leguminosae	<i>Azelia xylocarpa</i>	Mai Thae kha		Building materials	x				B27
Caesalpinioideae	<i>Azelia xylocarpa (Kurz) Craib</i>	Mai tae kha	En A1cd	Good timber			x		B14
Asteraceae	<i>Ageratum conyzoides DC.</i>	Nha Kheo		Medicinal plant			x		B14
Simaroubaceae	<i>Ailanthus malabarica DC.</i>	Nhom pa		stem used for firewood making			x		B14
Alangiaceae	<i>Alangium chinense Rehd.</i>	Khao yen		stem used for firewood and fence making			x		B14
Alangiaceae	<i>Alangium kurzii Craib</i>	Ton sa lik		stem used for firewood and fence making			x		B14
Mimosoideae	<i>Albizia chinensis (Osb.) Merr.</i>	Mai Kang hung		stem used for firewood and fence making			x		B14
Liliceae	<i>Allium cepa L.</i>	Phak bua		Edible leaves. Medicinal plant			x		B14
Liliceae	<i>Allium sativum L.</i>	Phak thiem		Edible leaves. Medicinal plant			x		B14
Araceae	<i>Alocasia longifolia Miq.</i>	Bon dong		Decorative plant			x		B14
Araceae	<i>Alocasia macrorrhiza (L.) D.Don.</i>	Ka bouk		-			x		B14
Zingiberaceae	<i>Alpinia purpurata (Veiell.) K. Schum</i>	Kha		Edible tube			x		B14
Zingiberaceae	<i>Alpinia spp.</i>	Kha paa		Food		x			B27
Apocynaccae	<i>Alstonia scholaris (L.) R.Br</i>	Mai tin ped		Timber			x		B14
Amaranthaceae	<i>Alternanthera sessilis</i>	Nha khau mai		Edible young shoot			x		B14
Malvaceae	<i>Althaea rosea (L.) Cav.</i>	Dok chad		Decorative plant			x		B14
Amaranthaceae	<i>Amaranthus gracilis Desf.</i>	Phak home		Edible young shoot			x		B14
Amaranthaceae	<i>Amaranthus spinosus Linn</i>	Phak home nam		Edible young shoot			x		B14
Amaranthaceae	<i>Amaranthus viridis L.</i>	Phak home ban		Edible young shoot			x		B14
Sapindaceae	<i>Amesiodendron chinense (Merr.) Hu.</i>	Ko ka	NT	Timber			x		B14
Commelinaceae	<i>Amiscolotype hispida (Less.& Rich) Hong</i>	Nha kap dong		Decorative plant			x		B14
Zingiberaceae	<i>Amomum ovideum Pierre. Ex Gagn.</i>	Mak naeng		Medicinal plant			x		B14
Zingiberaceae	<i>Amomum ovoidum/Amomum spp.</i>	Mak Neng		Income & exchange	x				B27
Zingiberaceae	<i>Amomum spp.</i>	Nor Phain Din		Food	x				B27
Vitaceae	<i>Ampelocissus martini</i>	Mak Lang Duak		Food		x			B27
Vitaceae	<i>Ampelopsis cantoniensis (H.&A.)L.</i>	-		Medicinal plant			x		B14
Anacardiaceae	<i>Anacardium occidentale L.</i>	Muang hi ma fan		Edible fruit and seed, stem used for firewood making			x		B14
Bromeliaceae	<i>Ananas comosus (L.) Merr.</i>	Mak nad		Edible ripe fruit			x		B14

Ancistrocladaceae	<i>Ancistrocladus tectorius</i>	Khu hang kouy		Medicinal plant and edible young leaves	x		x		B14; B27
Angiopteridaceae	<i>Angiopteris evecta (Forst.) Hoff</i>	Kud ka dong		Decorative fern			x		B14
Dipterocarpaceae	<i>Anisoptera costata Korth</i>	Mai bak	E	Good timber			x		B14
Combretaceae	<i>Anogeinsus acuminata Wall</i>	Ben mon		Timber and stem used for firedwood making			x		B14
Annonaceae	<i>Anomiamthus dulcis</i>	Brian Gra Young		Food		x			B27
Meliaceae	<i>Aphanomixis polystachya J.N. Parker</i>	Ta xua		Timber and stem used for firedwood making			x		B14
Poaceae	<i>Apluda mutica L.</i>	Oi nu		Medicinal plant			x		B14
Euphorbiaceae	<i>Aporasa ficifolia H. Baillon</i>	Muad khon		Stem used for firedwood making			x		B14
Euphorbiaceae	<i>Aporasa macrostachyus (Tul.)Muell-Arg</i>	Muad khon		Stem used for firedwood making			x		B14
Euphorbiaceae	<i>Aporasa villosa (Lindl.)H. Baill</i>	Mai muad		Stem used for firedwood making			x		B14
Araliaceae	<i>Aralia armata Seem</i>	Ton tang		Decorative plant, Young shoot can be eaten cooked			x		B14
Araliaceae	<i>Aralia foliosa Wall. & Clarke</i>	Tang noi		Decorative plant, Young shoot can be eaten cooked			x		B14
Mimosoideae	<i>Archidendron clyperia (Jack.) Niels</i>	Ben bai		Medicinal plant			x		B14
Mimosoideae	<i>Archidendron robinsonii (Gagn.) Niels</i>	Mai ba lee		Timber, and srem can be used for house biulding and firewood making			x		B14
Myrsinaceae	<i>Ardisia crenata Sims</i>	Tin cham		Decorative plant, and ripe fruit can be eaten			x		B14
Euphorbiaceae	<i>Ardisia mamillata Hance.</i>	Tin cham		Decorative plant, and ripe fruit can be eaten			x		B14
Myrsinaceae	<i>Ardisia villosa Roxb.</i>	Tin cham khon		Decorative plant, and ripe fruit can be eaten			x		B14
Myrsinaceae	<i>Ardisia virens Kurz.</i>	Tin cham		Decorative plant, and ripe fruit can be eaten			x		B14
Palmae	<i>Arenga pinnata (Wurmb.) Merr.</i>	Ton tan		Young shoot can be eaten cooked, Decorative plant			x		B14
Convolvulaceae	<i>Argyreia capitata Choisy</i>	Kheu khaao khon		Decorative plant			x		B14
Convolvulaceae	<i>Argyreia roxburghii Craib</i>	Khue chane		Decorative plant			x		B14
Asteraceae	<i>Artemisia vulgaris L</i>	Nad		Medicinal plant			x		B14
Moraceae	<i>Artocarpus chaplasha Roxb.</i>	kha noun, me pa		Good timber			x		B14

Moraceae	<i>Artocarpus heterophylla Lamk.</i>	Ton mi		Good timber, Edible friute			x		B14
Moraceae	<i>Artocarpus lokocha Roxb</i>	Ton had		Good timber			x		B14
Poaceae	<i>Arundinaria ciliata A.cammus.</i>	Mai chot		Young shoot can be eaten cooked			x		B14
Aspleniaceae	<i>Asplenium nidus L.</i>	Phak kud		Decorative fern			x		B14
Athyriaceae	<i>Athyrium esculentum (Retz) Copel</i>	Phak kud khao		Young shoot can be eaten raw or cooked			x		B14
Fungi	<i>Auricularia spp.</i>	Het Kadang		Food			x		B27
Meliaceae	<i>Azadirachta indica</i>	Phak Gadao		Food		x			B27
Euphorbiaceae	<i>Bacaurea ramiflora Lour.</i>	Mak fai		Edible fruit. Stem can be used for firewood and fence making			x		B14
Poaceae	<i>Bambusa arundinacea Willd.</i>	Mai phai pa		Young shoot can be eaten cooked. Stem used for house building and fence making	x	x			B14; B27
Poaceae	<i>Bambusa flexuosa</i>	Mai Ga Sa		Building materials			x		B27
Poaceae	<i>Bambusa spinosa</i>	Nor Mai		Food	x				B27
Poaceae	<i>Bambusa spp.</i>	Mai Go		Building materials			x		B27
Poaceae	<i>Bambusa spp.</i>	Bai Mai Phai		Fodder & Grazing	x				B27
Poaceae	<i>Bambusa spp.</i>	Bai Mai Phai Ban		Fodder & Grazing	x				B27
Poaceae	<i>Bambusa spp.</i>	Mai Phai		Building materials	x				B27
Poaceae	<i>Bambusa tulda Roxb.</i>	Mai bong		Young shoot can be eaten cooked. Stem used for house building and fence making			x		B14
Poaceae	<i>Bambusa spp.</i>	Mai Por		Fodder & Grazing			x		B27
Poaceae	<i>Bambusa vulgaris</i>	Mai Saeng Kham		Fodder & Grazing			x		B27
Acanthaceae	<i>Barleria strigosa Willd</i>	Khao leep		Fodder & Grazing			x		B14
Lecythidaceae	<i>Barringtonia macrostachya (Jack) Kurz</i>	Nom nhan		Stem can be used for firewood and fence making			x		B14
Caesalpinioideae	<i>Bauhinia variegata L.</i>	Ton sieu		Stem can be used for firewood and fence making. The flowers can be eaten cooked			x		B14
Leguminosae	<i>Bauhinia saccocalyx</i>	Kheua Somphan		Building materials			x		B27
Caesalpinioideae	<i>Bauhinia saccocalyx Pierre</i>	Po sean phan		The bark can be used for string making			x		B14
Caesalpinioideae	<i>Bauhinia sp.</i>	Sieu Khua		Decorative plant			x		B14
Cucurbitaceae	<i>Benincasia hispida (Thunb.) Cogn.</i>	Mak nam		the fruit cam be eaten cooked			x		B14

Asteraceae	<i>Bidens bipinnata L.</i>	Nha kon cham		Medicinal plant			x		B14
Euphorbiaceae	<i>Bischofia javanica BL.</i>	Khom fad		Goodtimber, young leaves and fruit can be eaten raw			x		B14
Blechnaceae	<i>Blenchunum orientale L.</i>	Koud kan deng		Decorative fern			x		B14
Asteraceae	<i>Blumea balsamifera (L.) DC</i>	Nad		Medicinal plant			x		B14
Bombacaceae	<i>Bombax ceiba. L</i>	Ngieu dok deng		Timber, and Decorative plant			x		B14
Bombacaceae	<i>Bombax insigis Wall</i>	Ngieu dok deng		Timber, and Decorative plant			x		B14
Anacardaceae	<i>Bouea burmanica</i>	Mak Bang		Food		x			B27
Euphorbiaceae	<i>Bouea oppositifolia</i>	Mak Phang		Food		x			B27
Nyctaginaceae	<i>Bougainvillea spectabilis Willd.</i>	Ton dok chia					x		B14
Brassicaceae	<i>Brassica intergrifolia (Weat.) O.B.Schultz</i>	Phak kad		Edible leaves			x		B14
Euphorbiaceae	<i>Breynia fruticosa (L.) Hook.f</i>	kok kang pa		Medicine Plant			x		B14
Moraceae	<i>Broussonetia papyrifera (L.) L'Her.ex Vent</i>	Po sa		Fiber bark. The stem used for firewood making			x		B14
Anacardaceae	<i>Buchanania obtusifolia</i>	Mak Laboota		Food		x			B27
Buddlejaceae	<i>Buddleja asiatica Lour</i>	Ngua sang		Medicine Plant			x		B14
Sterculiaceae	<i>Byttneria aspera Colebr</i>	Kheua sam hang		Medicine Plant			x		B14
Caesalpinioideae	<i>Caesalpinia digyna Rottl. & Willd</i>	Nam ka chai		Medicinal plant			x		B14
Caesalpinioideae	<i>Caesalpinia mimosoides Lamk</i>	Nam pu ya		Medicinal plant and eatable young shoot			x		B14
Palmae	<i>Calamus gracilis</i>	Vai Khome		Tools & Handicrafts	x				B27
Palmae	<i>Calamus javensis Ridly.</i>	Wai hang nu		-			x		B14
Palmae	<i>Calamus rudentum</i>	Vai yoon		Food	x				B27
Palmae	<i>Calamus sp.</i>	Wai ta bong		Young shoot can be eaten raw or cooked. Stem used for furniture making	x		x		B14; B27
Palmae	<i>Calamus viminalis Willd.</i>	Wai khom		Young shoot can be eaten raw or cooked. Stem used for furniture making			x		B14
Verbenaceae	<i>Callicarpa arborea Roxb</i>	Mai ko faa		Timber			x		B14
Verbenaceae	<i>Callicarpa longifolia Lam</i>	Sa ko faa		Decorative plant			x		B14
Guttiferae	<i>Calophyllum polyanthum Wall. Ex Choisy</i>	Mai song		Timber			x		B14
Combretaceae	<i>Calycopteris floribunda (Roxb) Lamk</i>	Khua ka daeng		Medicinal plant			x		B14
Burseraceae	<i>Canarium kerrii Craib</i>	Mak kok luam		Stem can be use for firewood making			x		B14
Papilionoideae	<i>Canavalia rosea</i>	Khua fak faa		Decorative plant			x		B14

Rubiaceae	<i>Canthium dicoceum</i> Gaerth var, <i>rostratum</i>	Kheung paa		stem use for firewood, and the fruit can be eaten cooked			x		B14
Rubiaceae	<i>Canthium horridum</i> BL	Mak kheung paa		stem use for firewood, and the fruit can be eaten cooked			x		B14
Capparaceae	<i>Capparis acutifolia</i> subsp, <i>sabiaefolia</i> (Hook.f. & TH/) Jac	Sa ton sa sou		Decorative plant			x		B14
Capparaceae	<i>Capparis micrantha</i> DC	Ton sa sou		Decorative plant			x		B14
Solanaceae	<i>Capsicum frutescens</i> L.	Mak phet		Edible fruit and young leaves			x		B14
Sapindaceae	<i>Cardiospermum halicacabum</i> L.	Sai num		Decorative plant			x		B14
Lecythidaceae	<i>Careya shpaerica</i>	Phak Gadone		Food	x				B27
Lecythidaceae	<i>Careya sphaerica</i> Roxb.	Ka don		Timber, and young leaves can be eaten raw			x		B14
Caricaceae	<i>Carica papaya</i> L.	Mak hung		Young fruit and flower can be eaten cooked, and the ripe fruit can be eaten raw			x		B14
Palmae	<i>Caryota mitis</i> Lour.	Tau hang noi		Decorative plant			x		B14
Palmae	<i>Caryota monostachya</i> Becc.	Tau hang noi		Decorative plant			x		B14
Flacourtiaceae	<i>Casearia grewiaefolia</i> Vent var <i>grewiaefolia</i>	Mai ka douk		Stem used for firewood and fence making			x		B14
Caesalpinioideae	<i>Cassia acidenialis</i> L	Nha lup meun		Medicinal plant			x		B14
Caesalpinioideae	<i>Cassia alata</i> L.	Khee lek ban		Medicinal plant			x		B14
Caesalpinioideae	<i>Cassia fistula</i> L	Ton dok khoun		Stem used for firewood, decorative plant			x		B14
Caesalpinioideae	<i>Cassia timoriensis</i> A. DC	Ton ka la pheuk		Stem used for firewood, decorative plant			x		B14
Caesalpinioideae	<i>Cassia tora</i> L	Nha lup meun		Medicinal plant			x		B14
Zingiberaceae	<i>Catimbum bracteatum</i> Roxb.	Man kha		Edible young shoot			x		B14
Amaranthaceae	<i>Celosia argentea</i> L	Dok hon kai		Decorative plant			x		B14
Ulmaceae	<i>Celtis tetrandra</i> Roxb	Mai Kieu		Stem used for firewood and fence making			x		B14
Apiaceae = Umbelliferae	<i>Centella asiatica</i> (L.) Urb	Phak nok		Medicinal plant and edible leaves			x		B14
Poaceae	<i>Cephalostachyum pergracile</i> Murro.	Mai phang		Young shoot can be eaten cooked. Stem used for house building and fence making			x		B14

Asteraceae	<i>Chromatolaena odorata</i> (Linn) King et Robins	Nha pheun		Medicinal plant			x		B14
Sapotaceae	<i>Chrysophyllum cainito</i> L	Ton nam nom		Edible fruit			x		B14
Poaceae	<i>Chrysopogon aciculatus</i> (Retz.) Trin.	Nha khuak		Medicinal plant			x		B14
Lauraceae	<i>Cinnamomum cambodiamum</i> H. Lee	Sa chuang		Medicinal plant and stem used for firewood and fence making			x		B14
Lauraceae	<i>Cinnamomum iners</i> Reinw	Sa chuang		Medicinal plant and stem used for firewood and fence making			x		B14
Vitaceae	<i>Cissus evrardil</i> Gagn.	Khua som koi		Edible young shoot			x		B14
Vitaceae	<i>Cissus hastata</i> PL	Khua houn		Medicinal plant			x		B14
Vitaceae	<i>Cissus javana</i> DC.	Khua poun		Medicinal plant			x		B14
Rutaceae	<i>Citrus grandis</i> (L.) Osb	Mak phouk		Edible ripe fruit			x		B14
Rutaceae	<i>Citrus limon</i> (L) Burm. F	Mak nao		Edible ripe fruit			x		B14
Rutaceae	<i>Clausena excavata</i> Burm. F	Song faa		Medicinal plant			x		B14
Capparaceae	<i>Cleome gynandra</i> L	Sa phak sien		Medicinal plant			x		B14
Verbenaceae	<i>Clerodendrum celebriookianum</i> Walp.	Phoung phing khao		Decorative plant			x		B14
Verbenaceae	<i>Clerodendrum schmidtii</i> C.B.CL	Phoung phing		Decorative plant			x		B14
Verbenaceae	<i>Clerodendrum serratum</i> (L) Moon	Phoung phing		Decorative plant			x		B14
Verbenaceae	<i>Clerodendrum</i> spp.	Kham Pi Dong		Medicine	x				B27
Palmae	<i>Cocos nucifera</i> L.	Mak phao		Edible fruit			x		B14
Araceae	<i>Colocasia esculenia</i> (L.) Schott.	Bon		Young can be eaten cooked			x		B14
Araceae	<i>Colocasia flavescents</i>	Born		Food	x				B27
Asclepiadaceae	<i>Colotropis gigantea</i> (L) Dryand	Ton dok hak		Decorative plant			x		B14
Combretaceae	<i>Combretum pilosum</i> Roxb	Khua kae		Decorative plant			x		B14
Connaraceae	<i>Connarus cochinchinensis</i> Pierre	Houn hai		Medicinal plant			x		B14
Asteraceae	<i>Conyza sumatrensis</i> (Retz) Walker	Nha fa lung		Medicinal plant			x		B14
Boraginaceae	<i>Cordia obliqua</i>	Manh Kho		Food		x			B27
Zingiberaceae	<i>Costus speculosus</i> (Koenig.) Smith	Kok uang		Medicinal plant			x		B14
Asteraceae	<i>Crassocephallum crepidioides</i> (Benth) Moore	Nha la mung		Edible young leaves			x		B14
Capparaceae	<i>Crateva nurvala</i> Buch Ham	Ton kum		Young can be eaten cooked. Stem used for firewood, soil erosion resistance			x		B14
Hypericaceae	<i>Cratoxylon formosum</i> (Jack) Dyer	Tieu som		Edible leaves and stem used for house building			x		B14

Hypericaceae	<i>Cratoxylon formosum subsp. Pruniflorum</i>	Tieu deng		Timber, and stem used for housing building			x			B14
Papilionoideae	<i>Crotalaria assamica Benth</i>	Mak hing man		Decorative plant			x			B14
Papilionoideae	<i>Crotalaria incana L.</i>	Mak hing		Decorative plant			x			B14
Papilionoideae	<i>Crotalaria verrucosa L.</i>	Mak hing man		Decorative plant			x			B14
Euphorbiaceae	<i>Croton abiongifolius Roxb</i>	Pao nhai		Stem used for firewood			x			B14
Euphorbiaceae	<i>Croton konggensis Gagn</i>	Pao thong		Medicinal plant			x			B14
Crypteroniaceae	<i>Crypteronia paniculata BL</i>	Mai sa am		Timber			x			B14
Araceae	<i>Cryptocoryne crispatula Engler</i>	Hang Khao nam		Decorative plant			x			B14
	<i>Cryptophrangium signatum</i>	Dong Hong		Income & exchange	x					B27
Zingiberaceae	<i>Cucuma domestica</i>	Waan		Medicinal plant			x			B14
Cucurbitaceae	<i>Cucurbita maxima Duch ex. Dam</i>	Mak euk		Edible fruit			x			B14
Moraceae	<i>Cudrania tricuspidata (Carr. Bur. Ex Lavell)</i>	Nam thaeng		Fruit eaten by animal			x			B14
Amaryllidaceae	<i>Curculigo latifolia Dryand. Ex Ait.</i>	Thien phi		Decorative plant			x			B14
Zingiberaceae	<i>Curcuma alisamatifolia or Curcuma Thoreli</i>	Phak Warn		Food	x					B27
Cuscutaceae	<i>Cuscuta chinensis Lam</i>	Khua kham		Young shoot can be eaten cooked			x			B14
Cyatheaceae	<i>Cyathea gigantea (Hook.) Holtt.</i>	Kud ton		Decorative fern			x			B14
Amaranthaceae	<i>Cyathula prostrata (L.) BL</i>	Sa khouay ngu		Medicinal plant			x			B14
Cycadaceae	<i>Cycas revoluta Thunb</i>	Pong. Hua nom knaa		Decorative plant			x			B14
Menispermaceae	<i>Cyclea barbata Miers</i>	Khua mo noi		Medicinal plant			x			B14
Menispermaceae	<i>Cyclea hypoglauca (Schauer) Diels</i>	Khua mo noi		Medicinal plant			x			B14
Orchidaceae	<i>cymbidium dayanum Reichh.F</i>	Ka darm phee		Decorative plant			x			B14
Poaceae	<i>Cynodon dactylon (L.) Pers</i>	Nha faed		Medicinal plant			x			B14
Cyperaceae	<i>Cyperus rotundus L</i>	Nha heo mu		Medicinal plant			x			B14
Araceae	<i>Cyrtosperma merkusil (Hassk) Schott.</i>	Phak nam		Young shoot can be eaten cooked			x			B14
Palmae	<i>Dalbergia schmidtiana Palmae</i>	Boun			x	x				B27
Leguminosae	<i>Dalbergia spp./Dialium spp.</i>	Mai Yoon		Building materials	x					B27
Solanaceae	<i>Datula metal L</i>	Khua ba		Decorative plant			x			B14
Poaceae	<i>Dcephalostachyum virgatum Kurz.</i>	Mai hia		Young shoot can be eaten cooked. Stem used for house building and fence making			x			B14
Podocarpaceae	<i>Decusocarpus wallichianus (Presi) de Laubenf.</i>	Ter choi		Timber, firewood making			x			B14

Caesalpinioideae	<i>Delomix regia (Hook) Raf</i>	Ton fang daeng		Decorative plant		x		B14
Orchidaceae	<i>Dendrobium sp</i>	Kouay mai		Young shoot can be eaten cooked		x		B14
Poaceae	<i>Dendrocalamus longifimbritus Gamble</i>	Mai phoung		Young shoot can be eaten cooked. Stem used for house building and fence making		x		B14
Papilionoideae	<i>Derris sp.</i>	Khua khau pok				x		B14
Papilionoideae	<i>Desmodium triquetrum (L) DC</i>	Pheng kham hoy		Medicinal plant		x		B14
Caesalpinioideae	<i>Dialium cochinchinensis Pierre</i>	Mak kham faed		Edible ripe fruit and stem used for firewood and fence making		x		B14
Gleichenuaceae	<i>Dicranopteris linearis (Burm.) Undrew.</i>	Kud khua		Decorative fern		x		B14
Dilleniaceae	<i>Dillenia baillonia</i>	San faeng		Timber and stem used for firewood making		x		B14
Dilleniaceae	<i>Dillenia Indica L.</i>	San kin		Edible fruit		x		B14
Dilleniaceae	<i>Dillenia kerii Craib</i>	San kheng		Edible fruit		x		B14
Dilleniaceae	<i>Dillenia obobata (BL) Hoogland</i>	San nhai		Timber		x		B14
Dilleniaceae	<i>Dillenia parviflora</i>	Mak San		Food	x			B27
Poaceae	<i>Dinochloa mascllelandii Kurz.</i>	Mai hae		Young shoot can be eaten cooked. Stem used for house building and fence making.		x		B14
Dioscoreaceae	<i>Dioscorea bulbifera L,</i>	Man pau		Decorative		x		B14
Dioscoreaceae	<i>Dioscorea clrrhosa Priain & Burk.</i>	Khua man		Decorative		x		B14
Dioscoreaceae	<i>Dioscorea glabra Roxb</i>	Khua man		Medicinal plant		x		B14
Discoriaceae	<i>Dioscorea spp.</i>	Manh Paa		Food		x		B27
Dioscoreaceae	<i>Dioscorea triphylla L.</i>	Koi		#N/A		x		B14
Ebunaceae	<i>Diospiros filipendula</i>	Kok Kanthong		Food		x		B27
Ebenaceae	<i>Diospiros spp.</i>	Gam Lang Moo Kaoh		Medicine	x			B27
Ebenaceae	<i>Diospyros chretioides Wall. Ex G. Don</i>	Huang kouang		Stem used for firewood and fence making		x		B14
Ebenaceae	<i>Diospyros kaki L.F</i>	Mak ko		Edible ripe fruit, and stem used for firewood and fence making		x		B14
Ebenaceae	<i>Diospyros phillippensis (Desr) Gurke</i>	Mon khai		Edible ripe fruit, and stem used for firewood and fence making		x		B14

Ebenaceae	<i>Diospyros sp.</i>	Mai nang dam		Edible ripe fruit, and stem used for firewood and fence making		x			B14
Melastomataceae	<i>Diplectria barabata (C.B.CL.) Frank & Roos</i>	En a		Decorative plant		x			B14
Dipterocarpaceae	<i>Dipterocarpus alatus</i>	Nam Mun yang		Income & exchange	x				B27
Dipterocarpaceae	<i>Dipterocarpus costatus Gaertn</i>	Mai nhang dong		Good timber		x	x		B14; B27
Dipterocarpaceae	<i>Dipterocarpus grandifolrus BLCO</i>	Nhang dong kiang		Good timber			x		B14
Dipterocarpaceae	<i>Dipterocarpus obtusifolius teysm</i>	Mai sad		Good timber			x		B14
Dipterocarpaceae	<i>Dipterocarpus tuberculatus</i>	Mai Goung		Building materials		x			B27
Asclepiadaceae	<i>Dischidia balansae</i>	Sarra Ring (k)		Medicine		x			B27
Asclepiadaceae	<i>Dischidia nummularia R.Br.</i>	Ka doum noi		Decorative plant			x		B14
Asclepiadaceae	<i>Dischidia umbricata (BL) Done</i>	Khua ka doum		Decorative plant			x		B14
Bignoniaceae	<i>Dolichandrone spilata</i>	Khae puk na		Stem used for firewood			x		B14
Agavaceae	<i>Dracaena angustifolla</i>	Khon kaen		Young shoot can be eaten cooked, Medicinal plant	x		x		B14; B27
Polypodiaceae	<i>Drynaria quereifolia (L.) J. Smith</i>	Kud hua ka hok		Decorative fern			x		B14
Sonneratiaceae	<i>Duabanga grandiflora (DC) Walp</i>	Lin ngo		Tinber			x		B14
Papilionoideae	<i>Dunbaria longeracemosa Craib</i>	Kheu thoa he		Medicinal plant			x		B14
Meliaceae	<i>Dysaxylum binectariferium Hook.f</i>	Ta suu		Stem used for firewood making			x		B14
Elaeagnaceae	<i>Elaeagnus conferta</i>	Mak Lord		Food		x			B27
Elaeocarpaceae	<i>Elaeocarpus floribundus BL</i>	Khai noun		Can be planted along the river bank for soil protection			x		B14
Elaeocarpaceae	<i>Elaeocarpus siamensis</i>	Som moun		Stem used for firewood making and fence making			x		B14
Elaeocarpaceae	<i>Elaeocarpus sp.</i>	Moun		Timber			x		B14
Asteraceae	<i>Elephantopus scaber L</i>	Fai nok khum		Medicinal plant			x		B14
Poaceae	<i>Eleusine indica (L.) Gaertn</i>	Nha fak khouay		Edible young shoot			x		B14
Euphorbiaceae	<i>Endospermum chinense Benth</i>	Mai mak ouk		Timber			x		B14
Juglandaceae	<i>Engelhardia spicata Lesch. & BL.</i>	Mai phao		Stem used for house building			x		B14
Mimosoideae	<i>Entada glandulosa Pierre.ex Gagn</i>	Mak lae noi		The seed can be eaten cooked			x		B14
Mimosoideae	<i>Entada phaseoloides (L.) Merr.</i>	Mak lae		The seed can be eaten cooked			x		B14

Araceae	<i>Epipremnum giganteum</i> Schott,	Khua mum		Decorative plant		x		B14
Equisetaceae	<i>Equisetum diffusum</i> D.Don	Gna thod pong		Decorative fern		x		B14
Eriocaulaceae	<i>Eriocaulon hayatatum</i> Koyama.	Nha hua ngok		Decorative plant		x		B14
Apiceae	<i>Eryngium foetidum</i> L.	Home pe		Edible leaves		x		B14
Caesalpinioiseae	<i>Erythrophleum fordii</i> Oliv.	Mai ka cha	E	Good timber, and stem can be use for house building, charcol		x		B14
Myrtaceae	<i>Eucalyptus</i> sp.	Ton vik		medicinal plant, and stem used for firewood and fence making		x		B14
Rutaceae	<i>Euodia leptota</i> (Spreng.) Merr.	Dee khon		Medicinal plant		x		B14
Euphorbiaceae	<i>Euphorbia antiquorum</i> L.	Chan dai		Decorative		x		B14
Euphorbiaceae	<i>Euphorbia hirta</i> L.	Nhang uang		Medicinal plant		x		B14
Simaroubaceae	<i>Eurycoma longifolia</i> Jack.	Nhik bo tong		Medicinal plant		x		B14
Papilionoideae	<i>Eythrina stricta</i> Roxb.	Ton thong		Decorative plant, and edibl young leaves		x		B14
Loganiaceae	<i>Fagraea fragrans</i> Roxb.	Ton man pa		Good timber		x		B14
Bignoniaceae	<i>Fernandoa adenophyllum</i> (D.Don.) steen	Khae khon		Stem used for firewood making		x		B14
Moraceae	<i>Ficus altissima</i> BL.	Hai deng		Fruit eaten by animals, birds		x		B14
Moraceae	<i>Ficus benjamina</i> var. <i>nada</i> (Miq.) Barret	Hai bai noi		Fruit eaten by animals, birds		x		B14
Moraceae	<i>Ficus callophylla</i> BL. Var. <i>callophylla</i>	Hai yon		Fruit eaten by animals, birds		x		B14
Moraceae	<i>Ficus fulva</i> Reinw. & BL.	Ton ham hok		Fruit eaten by animals, birds		x		B14
Moraceae	<i>Ficus heterophylla</i> L.F var. <i>heterophylla</i>	Nod nam		Fruit eaten by animals, birds		x		B14
Moraceae	<i>Ficus hirta</i> var. <i>roburghii</i> (Miq.) King	Hai khon		Fruit eaten by animals, birds		x		B14
Moraceae	<i>Ficus hispida</i> L.f. var. <i>hispida</i>	Mak dua pong		Edible fruit		x		B14
Moraceae	<i>Ficus ichtnopoda</i> Miq.	Ton nom ma		Edible fruit		x		B14
Moraceae	<i>Ficus Pandurata</i> Hance	Dua paa		Edible eaten by birds		x		B14
Moraceae	<i>Ficus semicordata</i> Buch. - Ham.ex J.E.Sm.	Mak nod ton		Ripe fruit can be eaten raw		x		B14
Moraceae	<i>Ficus septica</i> Burn.f.var. <i>septica</i>	Mak dua pong		Fruit eaten by birds, fish		x		B14
Moraceae	<i>Ficus variegata</i> BL. Var. <i>varlegata</i>	Mak dua nam		Fruit eaten by birds, fish		x		B14
Leguminosae	<i>Flamingia chappa</i>	A yerng Rarm / A Young Rean (k)		Medicine		x		B27
Guttiferae	<i>Garcinia gracilis</i> Pierre.	Mak pern		Edible fruit		x		B14
Guttiferae	<i>Garcinia oliveri</i> Pierre.	Som mong		Edible fruit		x		B14
Guttiferae	<i>Garcinia</i> sp.	Mai nga loi		Stem used for firewood, fence making		x		B14
Guttiferae	<i>Garcinia tinctoria</i> (DC) Wight.	Som pong		Stem used for firewood, fence making		x		B14

	<i>Gardenia obtusifolia</i>	Mak Sida Paa		Stem used for firewood, fence making		x				B27
Rubiaceae	<i>Gardenia Ph</i>	Khai nau		Stem used for firewood, fence making			x			B14
Rubiaceae	<i>Gardenia sootepensis Hutch.</i>	Sida khok		Stem used for firewood, fence making			x			B14
Rubiaceae	<i>Gardenia spp.</i>	Dok Koi Dan		Income & exchange	x					B27
Poaceae	<i>Gigantochloa albocillata</i>	Bai Mai Lai		Fodder & Grazing	x					B27
Zingiberaceae	<i>Globba sp.</i>	Waan fai		Medicinal plant			x			B14
Euphorbiaceae	<i>Glochidion eriocarpum Champ.</i>	Ton khee mod		Stem used for firewood, fence making			x			B14
Euphorbiaceae	<i>Glochidion lanceolarium (Roxb.) Voigt.</i>	Sa khee mod		Stem used for firewood, fence making			x			B14
Anacardiaceae	<i>Gluta megalocarpa (Evt.) Tard</i>	Mai nam kieng		Stem for firewood and good timber			x			B14
Rutaceae	<i>Glycosmis citrifolia (Willd.) Lindl.</i>	Som sun		Stem used for firewood, fence making			x			B14
Verbenaceae	<i>Gmelina arborea Roxb.</i>	Mai so		Good timber			x			B14
Gnetaceae	<i>Gnetum montanum Margf</i>	Khua mua		The fruit can be eaten cooked			x			B14
Icacinaceae	<i>Gonocaryum lobbianum (Mierr.) Kurz.</i>	Sieng muang		Stem used for firewood			x			B14
Malvaceae	<i>Gossypium herbaceum L.</i>	Fai		Fiber			x			B14
Tiliaceae	<i>Grewia paniculata Roxb. ex DC</i>	Khom som		Stem used for firewood, Ripe fruit can be eaten			x			B14
Simarubaceae	<i>Harrisonia perfolata (BL.) Merr.</i>	Kon tha		Medicinal plant			x			B14
Rubiaceae	<i>Hedyotis auricularia L.</i>	Nha chi lo		Medicinal plant			x			B14
Rubiaceae	<i>Hedyotis capitellata Wall ex D. Don.</i>	Bia noy		Medicinal plant			x			B14
	<i>Hedyotis corymbosa</i>	Phak Khome				x				B27
Rubiaceae	<i>Hedyotis fusticiformis (Pit.) Phamhang</i>	-		Medicinal plant			x			B14
Rubiaceae	<i>Hedyotis hispida Retz.</i>	-		Medicinal plant			x			B14
Sterculiaceae	<i>Helictere isora L.</i>	Po vit		Medicinal plant			x			B14
Sterculiaceae	<i>Helicteres angustifolia L.</i>	Po khee kai		Medicinal plant			x			B14
Malvaceae	<i>Hibiscus rosa - sinensis L.</i>	Ton soi deng		Decorative plant			x			B14
Apocynaceae	<i>Holarrhena pubescens (Buch-Ham.) Wall ex D. Don.</i>	Mouk nhai		Stem used for firewood			x			B14
Maranthaceae	<i>Holopterygia blumei (Koern.) K. Schutt.</i>	Tong ching		Decorative			x			B14
Araceae	<i>Homalonema tonkinensis Engles,</i>	Bon pa kang		Medicinal plant			x			B14
Euphorbiaceae	<i>Homonoia riparia Lour.</i>	Ton kai		The tree can be planted along the river bank for soil erosion protection			x			B14
Dipterocarpaceae	<i>Hopea ferrea Pierre in Lane.</i>	Mai khaen hin	E	Good timber			x			B14
Dipterocarpaceae	<i>Hopea odorata Roxb.</i>	Mai khaen hua	V	Good timber			x			B14

Dipterocarpaceae	<i>Hopea pierrei</i>	Mai La Aen	Building materials	x			B27
Asclepiadaceae	<i>Hoya macrophylla</i> BL.	Dok tang	Decorative plant		x		B14
Asclepiadaceae	<i>Hoya obovanta</i> Done in DC.	Dok tang	Decorative plant		x		B14
Poaceae	<i>Imperata cylindrica</i> Beauv.	Nha kha	Medicinal plant. Leaves can be used for house roofing	x	x		B14; B27
Convolvulaceae	<i>Ipomoea batatas</i> (L.) Lamk.	Mun dang	Edible tube and young leaves		x		B14
Irvingiaceae	<i>Irvingia malayana</i> Oliv. Ex A. Benn	Mai bok	Timber, charcol and firewood making	x	x		B14; B27
Rubiaceae	<i>Ixora stricta</i> Roxb.	Ton khem deng	Decorative plant		x		B14
Oleaceae	<i>Jasminum nervosum</i> Lour.	Khua sai kai	Medicinal plant		x		B14
Euphorbiaceae	<i>Jatropha curcus</i> L.	To mak gnau	Can be planted for fence making		x		B14
Myristicaceae	<i>Knema furfulacea</i> Aust.	Mai luad nhai	Stem used for firewood making		x		B14
Myristicaceae	<i>Knema pierrei</i> Wab.	Sa luad	Stem used for firewood making		x		B14
Palmae	<i>Korthaisia taciniosa</i> Mart.	Wai ta leuk	Young shoot can be eaten raw or cooked. Stem used for furniture making		x		B14
Lythraceae	<i>Lagerstroemia calyculata</i> Kurz	Mai peuy	Timber		x		B14
Lythraceae	<i>Lagerstroemia floribunda</i> Jack.	Mai peuy	Timber		x		B14
Lythraceae	<i>Lagerstroemia macrocoxarpa</i> Wall.	Ka ka lau	Stem used for firewood and fence making. Decoration		x		B14
Araceae	<i>Lasia spinosa</i>	Mak Tapiak	Food	x			B27
Araceae	<i>Lasia spinosa</i> (L.) thw,	Phak nam	Young shoot can be eaten cooked		x		B14
Fagaceae	<i>Lasianthus hispidulus</i> Drake.	Khan heo nok kho khon	Decorative		x		B14
Leeaceae	<i>Lasianthus kerri</i> Craib	Kankeo nok kho	Medicinal plant		x		B14
Rubiaceae	<i>Lasianthus poilanei</i> Pit	Kankeo nok kho	Medicinal plant		x		B14
Leeaceae	<i>Leea aequata</i> L.	Tang kai khon	Medicinal plant		x		B14
Acanthaceae	<i>Leea indica</i> (Burm.f.) Merr.	Tang kai	Decorative plant		x		B14
Sapindaceae	<i>Lepisanthes rubiginosa</i>	Mak Luat / Mak Houat	Food		x		B27
Rubiaceae	<i>Lepisanthes tetraphylla</i> (Vahl.)	Mak huad	Decorative plant		x		B14
Fagaceae	<i>Lithocarpus bacgiangensis</i> (Hick.&Cam) A. Cam.	Ko ta mu	Timber		x		B14
Fagaceae	<i>Lithocarpus lindieyanus</i> (A.D C) A. Cam	Ko ta mu	Timber		x		B14
Lauraceae	<i>Lithocarpus megastachya</i> Hick.&Cam	Ko ta mu	Timber		x		B14
Onagraceae	<i>Litsea cubeba</i> (Lour.) Pers.	Si khai ton	Medicinal plant		x		B14

Palmae	<i>Livistona saribus</i> (Lour.) Merr. & Chev.	Ton kho		Edible young shoot and fruit. Decorative plant		x			B14
Cucurbitaceae	<i>Ludwigia ocatovalvis</i> (Jack.) Raven	Nha luk na		Decorative		x			B14
Solanaceae	<i>Luffa cylindrica</i> (L.) M.A. Roem.	Mak bop		Edible fruit and young shoot		x			B14
Solanaceae	<i>Lycopersicon esculentum</i> (L.) Mill.	Mak den		Edible fruit		x			B14
Euphorbiaceae	<i>Lycopersicon esculentum var cerariforme Alef</i>	Mak den noi		Edible fruit		x			B14
Lycopodiaceae	<i>Lycopodium cernua</i> (L.) Flanco. & vasc.	Kud kheekhep		Decorative fern		x			B14
Schizacaceae	<i>Lygodium flexuoxum</i> (L.) SW.	Phak kud khua		Decorative fern		x			B14
Schizacaceae	<i>Lygodium polystachyum</i> Wall. & Moore	Kud ngong		Decorative fern		x			B14
Schizacaceae	<i>Lygodium salie ifoilium</i> Presi.	Phak kud khua		Young shoot can be eaten raw or cooked		x			B14
	<i>Lygodium spp.</i>	Phak Good Ngong				x			B27
Myrsinaceae	<i>Macaranga denticulata</i> (BL.) Muell-Arg.	Tong khop		Stem used for firewood		x			B14
Myrsinaceae	<i>Maesa indica</i> Wall.in Roxb.	Ton ton Khup		Medicinal plant		x			B14
Euphorbiaceae	<i>Maesa membranacea</i> A.DC	Ton khup		Medicinal plant		x			B14
Euphorbiaceae	<i>Mallotus barbatus</i> Muell - Arg.	Tong ta ven		Stem used for firewood		x			B14
Euphorbiaceae	<i>Mallotus macrostachyus</i> (Miq.) Muell-Arg.	Tong tau		Stem used for firewood		x			B14
Anacardiaceae	<i>Mallotus thorellii</i> Gagn.	Mai sae		Stem used for firewood		x			B14
Anacardiaceae	<i>Mangifera indica</i> Linn	Mak muang		Timber, Edible fruit and young shoot		x			B14
Euphorbiaceae	<i>Mangifera silvatica</i> Lec.	Mak muang paa	D	Timber, Edible fruit and young shoot		x			B14
Anacardiaceae	<i>Mangifera spp.</i>	Mak Muang Paa		Food	x				B27
Bignoniaceae	<i>Manihot esculenta</i> Crantz.	Man ton		Edible tube, Young shoot and flower can be eaten cooked		x			B14
Melastomataceae	<i>Markhamia stipulata</i>	Ton khae		Edible flower		x			B14
Marsileaceae	<i>Marsilea crenata</i> Presi	Phak vaen		Young shoot can be eaten raw or cooked		x			B14
Meliaceae	<i>Melastoma normale</i> D. Don.	En a		Fruit used for dye making		x			B14
Melastomataceae	<i>Melastoma sp.</i>	Peuada (k)		Medicine		x			B27
Melastomataceae	<i>Melia azedarach</i> L.	Ka dau sang		Stem used for firewood making		x			B14
Melastomataceae	<i>Memecylon edule</i> Roxb.	Muad ae		Stem used for firewood making, Medicinal plant		x			B14

Melastomataceae	<i>Memecylon fruticosum</i> King.	Sa muad ae		Stem used for firewood making			x			B14
Lamiaceae	<i>Mentha aquatica</i> L.	Phak kan kam		Edible leaves, medicinal plant			x			B14
Convolvulaceae	<i>Merremia vitifolia</i> (Burm.f) Hall.f	Khua khee kaduan		Decorative plant			x			B14
Rutaceae	<i>Micromelum integerrimum</i> (Buch Ham) Roem	Ka be khon		Medicinal plant			x			B14
Poaceae	<i>Microstegium ciliatum</i> (Trin) A.Camus	Nha sai		-			x			B14
Papilionoideae	<i>Milletia</i> sp.	Mai hae		Stem used for firewood making			x			B14
Mimosoideae	<i>Mimosa diploricha</i> C. Wright ex Sauvalli	Nam keo		-			x			B14
Mimosoideae	<i>Mimosa pigra</i> L	Ka thin nam		Medicinal plant			x			B14
Mimosoideae	<i>Mimosa pudica</i> L	Nha gnup		Edible fruit after cooking			x			B14
Rubiaceae	<i>Mitragyana diversifolia</i> (G.Don) Havil	Mai luang		Timber			x			B14
Rubiaceae	<i>Mitragyana rotundifolia</i> (Roxb) O.Ktze	Mai thom		Timber			x			B14
Rubiaceae	<i>Morinda tomentosa</i> Heyn	Nho khok		Stem used for firewood making			x			B14
Papilionoideae	<i>Mucuna prupriens</i> (L) DC	Khua tum nhae		Poisonous plant			x			B14
Musaceae	<i>Musa acuminata</i> Colla.	Kouay pa		Edible young shoot			x			B14
Musaceae	<i>Musa nana</i> Lour.	Kouay suk kheo		Edible fruit			x			B14
Musaceae	<i>Musa rosacea</i> Jacq.	Kouay nam		Edible fruit			x			B14
Rubiaceae	<i>Mussaenda cambodiana</i> Pierre	Dok mieng ka bua		Decorative plant			x			B14
Sapindaceae	<i>Nephelium lappaceum</i> L.	Lum nhai pa		Timber, ripe fruit can be eaten			x			B14
Solanaceae	<i>Nicotiana tabacum</i> L	Nha doud		Poisonous plant			x			B14
Lauraceae	<i>Nothaphopebe umbellifera</i>	Yang Bong		Income & exchange	x					B27
Ochnaceae	<i>Ochna intergerrima</i>	Mai sang nao		-		x	x			B14; B27
Lamiaceae	<i>Ocimum basilicum</i> L	Phak I tou		Medicinal plant			x			B14
Olacaceae	<i>Olax scandens</i> Roxb	Khouay siek		Medicinal plant			x			B14
Papilionoideae	<i>Ormosia pinnata</i> (Lour) Merr	Mai khee mu		Stem used for firewood and fence making			x			B14
Bignoniaceae	<i>Oroxylon indicum</i> (L) Vent	Mai Lin Mai		Young fruit can be eaten cooked		x	x			B14; B27
Poaceae	<i>Oryza sativa</i> L,	Khau		Edible seed			x			B14
Melastomataceae	<i>Osbeckia chinensis</i> L.M	Khang hee hak		-			x			B14
Oxalidaceae	<i>Oxalis corniculata</i> L	Som seng ka		Edible leaves			x			B14
Melastomataceae	<i>Oxyspora paniculata</i> (D.Don) DC	En a dong		Decorative plant			x			B14

Poaceae	<i>Oxytenanthera albociliata</i> Munro	Mai lai		Young shoot can be eaten cooked. Stem used for house building and fence making.	x			B14
Poaceae	<i>Oxytenanthera parvifolia</i> Br.	Mai sod		Young shoot can be eaten cooked. Stem used for house building and fence making.	x			B14
Papilionoideae	<i>Pachyrrhizus erosus</i> (L) Urban	Man phau		Edible tube		x		B14
Rubiaceae	<i>Paederia consimilis pierre ex. Pit</i>	Khua tod ma noi		Medicinal plant		x		B14
Rubiaceae	<i>Paederia scadens</i> (Lour) Merr	Khua tod ma nhai		Medicinal plant		x		B14
Sapotaceae	<i>Palaquium</i> sp.	Yang bong deng		The bark for glue making		x		B14
Pandanaceae	<i>Pandanus furcatus</i> Roxb,	Chieng na		Decorative plant		x		B14
Pandanaceae	<i>Pandanus</i> spp.	Daij/Taij		Tools & Handicrafts	x			B27
Pandanaceae	<i>Pandanus</i> spp.	Toei / Teuay		Tools & Handicrafts	x			B27
Poaceae	<i>Panicum</i> sp.	Nha nhoung		-		x		B14
Magnoliaceae	<i>Paramichelia bailonia</i> (Pierre) Hu	Cham pa pa		Good timber		x		B14
Dipterocarpaceae	<i>Parashorea stellata</i> Kurz	Mai hau		Good timber		x		B14
Mimosoideae	<i>Parkia sumatrana</i> Miq	khon kong		Timber		x		B14
Passifloraceae	<i>Passiflora foetida</i> L	Nod sa		Medicinal plant		x		B14
Rubiaceae	<i>Pavetta indica</i> L	Tom khem kao		Decorative plant		x		B14
Tiliaceae	<i>Peltace burmanica</i> Kurz	Si siet		Medicinal plant	x	x		B14; B27
Caesalpnioidae	<i>Peltophorum dasyrrachis</i> (Miq) Kurz	Mai sa phang		Timber, stem used for firewood making		x		B14
Poaceae	<i>Pennisetum setaceum</i> Forssk.	Nha hang ma		Decorative plant		x		B14
Menispermaceae	<i>Pericampilus glaucus</i> (Lamk) Merr	Khua tup tua		Medicinal plant		x		B14
Lauraceae	<i>Phoebe lanceolata</i> Nees	Phai ven		Stem used for firewood making		x		B14
Lauraceae	<i>Phoebe tavoyana</i> Hook f.	Sa phai ven		Stem used for firewood making		x		B14
Maranthaceae	<i>Phrynium plancetorum</i> (Lour) Merr.	-		Decorative plant		x		B14
Euphorbiaceae	<i>Phyllanthus emblica</i> L	Ton kham pom		Medicinal plant, edible fruit	x	x		B14; B27
Papilionoideae	<i>Phyllodium punchellum</i> (L) Benth	Ked lin		Decorative plant		x		B14
Solanaceae	<i>Physalis angulata</i> L	Mak tum tup		Decorative plant		x		B14
Piperaceae	<i>Piper betle</i> L	Phou		Medicinal plant		x		B14
Piperaceae	<i>Piper lolot</i> C. DC	I leud		Edible leaves		x		B14
Piperaceae	<i>Piper mutabile</i> C. DC	Sa phou		Decorative plant		x		B14
Polypodiaceae	<i>Platynerium grande</i> A. Cunn. Ex J.Sm	Nhee va		Decorative fern		x		B14
Plumbaginaceae	<i>Plumbago indica</i>	Pid pi deng		Good medicinal plant		x		B14

Commelinaceae	<i>Pollia thyrsiflora (BL) End & Hassk</i>	Nha kap		Decorative plant		x		B14
Annonaceae	<i>Polyalthia sp.</i>	Mak kouay hen		Stem used for firewood		x		B14
Polygonaceae	<i>Polygonum chinensis L</i>	Som phian		Edible young stem		x		B14
Polygonaceae	<i>Polygonum tomentosum Wild</i>	Pak phai khon		Decorative plant		x		B14
Sapindaceae	<i>Pomatia pinnata J.R & G.Forst</i>	Ko ka		Timber		x		B14
Araceae	<i>Pothos scadens L,</i>	Wai sa noi		Decorative plant		x		B14
Acanthaceae	<i>Pseuderanthemum palatiferum Radlk</i>	Sa hom		Decorative plant		x		B14
Mayrtaceae	<i>Psidium guajava Linn</i>	Mak si da		Edible fruit, Medicinal plant		x		B14
Caesalpnioidae	<i>Ptelobiem intergrum Craib</i>	Sa nam ka chai		Decorative plant		x		B14
Dennstaedtiaceae	<i>Pteridium aquilium (CL.) Kuhn</i>	Phak kud		Decorative fern		x		B14
Papilionoideae	<i>Pterocarpus macrocarpus Kurz</i>	Mai dou		Good timber	x	x		B14; B27
Sterculiaceae	<i>Pterospermum heterophyllum Hance</i>	Mai ham ao		Timber		x		B14
Fagaceae	<i>Quercus kerrii Craib</i>	Ko kaek		Stem used for firewood making		x		B14
Rubiaceae	<i>Randia spinosa BL.</i>	Ngieng douk		Stem used for firewood making		x		B14
Rubiaceae	<i>Randia tomentosa BL.in DC</i>	Nam theng		Stem used for firewood making		x		B14
Rubiaceae	<i>Randia uligiosa (Retz) DC</i>	Loum phouk		Stem used for firewood making		x		B14
Apocynaceae	<i>Rauvolfia cambodiana Pierre ex Pit.</i>	Kh yom phou		Decorative plant		x		B14
Araceae	<i>Rhaphidophora decursiva (Roxb) Schott</i>	Khua mum soi		Decorative plant		x		B14
Palmae	<i>Rhapis laosensis</i>	Sarn		Food	x			B27
Palmae	<i>Rhapis Macrantha Gagn.</i>	San		Edible young shoot. Decorative plant		x		B14
Anacardiaceae	<i>Rhus chinensis Muell.</i>	Mak phod		Edible fruit		x		B14
Euphorbiaceae	<i>Ricinus communis L.</i>	Hung sa		Poisonous plant		x		B14
Phytolacaceae	<i>Rivina humilis L.</i>	Toum tuak		Edible young shoot		x		B14
Boraginaceae	<i>Rotula aquatica Lour.</i>	Khai hang nak		Decorative plant		x		B14
Rosaceae	<i>Rubus multibracteus Levl. & Van.</i>	Mak thum		Edible fruit		x		B14
Poaceae	<i>Saccharum officinarum Linn.</i>	Oi		Sugar		x		B14
Poaceae	<i>Saccharum spontaneum Linn.</i>	Lau		Young shoot can be eaten cooked		x		B14
Caesalpinoideae	<i>Salaca declinata (Jack.) Miquel.</i>	Kham pha am		Stem used for firewood. Decorative plant		x		B14
Mimosoideae	<i>Samanea saman (Jack.) Merr.</i>	Mai sam sa		Timber. Decorative plant		x		B14
Meliaceae	<i>Sandoricum koetjape (Burm.f.) Merr.</i>	Ton tong		Timber. Edible fruit	x	x		B14; B27
Euphorbiaceae	<i>Sapium discolor Muell-Arg.</i>	Mai pang		Timber		x		B14
Rubiaceae	<i>Sarcocephalus cordatus Miq.</i>	Kok kan luang		Timber. Medicinal plant		x		B14
Euphorbiaceae	<i>Sauropus pierrei (Beille.) Croizat.</i>	Phak ban dong		Edible leaves		x		B14

Sterculiaceae	<i>Scaphium macropodium (Miq.) Blum.</i>	Ka mak haeng		Stem used for firewood			x		B14
Theaceae	<i>Schima wallichii (DC) Korth.</i>	Mai khai so		Good timber			x		B14
Cyperaceae	<i>Scleria purpurascens Steud.</i>	Khom pao nhai		Decorative plant			x		B14
Cyperaceae	<i>Scleria terrestris (L.) Fossett.</i>	Nha khom pao		Decorative plant			x		B14
Scrophulariaceae	<i>Scoparia dulcis L.</i>	Khon Khee thang		Medicinal plant			x		B14
Selaginellaceae	<i>Selaginella strigosa Bett.</i>	Tin kup kae		Decorative fern			x		B14
Leguminosae	<i>Senna (Cassia) siamea</i>	Phak Khisome		Food	x				B27
Leguminosae	<i>Senna alata</i>	Bai Khilek Yai (Bai Khinon)		Food		x			B27
Papilionoideae	<i>Sesbania grandiflora (L.) Pers.</i>	Dok khae khao		Flower eaten cooked			x		B14
Sapindaceae	<i>Shleichera trijunga</i>	Mak Kor Som		Food	x				B27
Dipterocarpaceae	<i>Shorea obtusa Wall.</i>	Mai chik		Timber		x	x		B14; B27
	<i>Shorea obtuse and shorea siamensis</i>	Khisi			x				B27
Dipterocarpaceae	<i>Shorea siamensis</i>	Mai Si		Building materials	x				B27
Dipterocarpaceae	<i>Shorea siamensis Miq.</i>	Mai hang		Timber			x		B14
Malvaceae	<i>Sida acuta Burm.f.</i>	Nha khad		Medicinal plant			x		B14
Malvaceae	<i>Sida rhombifolia L.</i>	Nha khad		Medicinal plant			x		B14
Caesalpinioideae	<i>Sindora siamensis Teysm. ex Miq.</i>	Mai tae nam		Good timber			x		B14
Smilacaceae	<i>Smilax bracteata Presl.</i>	Nha hua		Decorative plant			x		B14
Smilacaceae	<i>Smilax china L.</i>	Khua kuang		Edible young leaves			x		B14
Smilacaceae	<i>Smilax glabra Roxb.</i>	Nha hua		Medicinal plant			x		B14
	<i>Smilax spp.</i>	Kheua Khuang					x		B27
Smilacaceae	<i>Smilax spp.</i>	Hua Ya Luang		Medicine	x				B27
Solanaceae	<i>Solanum capsicoides Allioni</i>	Mak khua kun		Edible fruit. Medicinal plant			x		B14
Solanaceae	<i>Solanum ferox L.</i>	Mak euk		Edible fruit			x		B14
Solanaceae	<i>Solanum melongena L.</i>	Khua ham ma		Edible fruit			x		B14
Solanaceae	<i>Solanum torvum Swartz.</i>	Khaeng faa		Edible fruit		x	x		B14; B27
Solanaceae	<i>Solanum trilobatum L.</i>	Khaeng khom		Edible fruit			x		B14
Verbenaceae	<i>Sphenodesma amethystina P.Dop.</i>	Khua ka deng		Decorative plant			x		B14
Verbenaceae	<i>Sphenodesma thorelii P.Dop.</i>	Khua ka deng		Decorative plant			x		B14
Asteraceae	<i>Spilanthes paniculata Wall. ex DC</i>	Phak kad		Young can be eaten cooked. Medicinal plant			x		B14
Anacardiaceae	<i>Spondias lakhonensis Pierre.</i>	Som ho		Timber. Edible young shoot and fruit			x		B14

Anacardiaceae	<i>Spondias oxillaris</i> Roxb.	Mak mu		Timber.Edible young shoot and fruit			x		B14
Anacardiaceae	<i>Spondias pinnata</i> (Koenig & L.F.) Kurz.	Mak kok		Edible fruit	x		x		B14; B27
Moraceae	<i>Streblus asper</i> Lour.	Nam khee haed		Stem used for firewood making. Decorative plant			x		B14
Moraceae	<i>Streblus ilicifolia</i> (Kurz.) Corn.	Nam khee haed		Stem used for firewood making. Decorative plant			x		B14
Moraceae	<i>Streblus taxoides</i> (Heyne.) Kurz.	Nam khee haed		Stem used for firewood making. Decorative plant		x	x		B14; B27
Acanthaceae	<i>Strobilanthes flaccidifolius</i> Nees	Hom ban		Leaves used for dye making			x		B14
Loganiaceae	<i>Strychnos nuc-vomica</i> L.	Toum ka		Medicinal plant. Stem used for firewood making			x		B14
Loganiaceae	<i>Strychnos</i> sp.	Toum ka khua		Medicinal plant.			x		B14
Styracaceae	<i>Styrax tonkinensis</i> (Pierre.) Craib.ex Hardw.	Sa nhan		Medicinal plant.			x		B14
Myrtaceae	<i>Syzygium chlorantum</i> Duthi.	Va daeng		Timber.			x		B14
Myrtaceae	<i>Syzygium cumini</i> (L.) Druce.	Mai va		Timber.			x		B14
Myrtaceae	<i>Syzygium semaragense</i> (BL.) Merr.	Mak Chiang		Timber.			x		B14
Myrtaceae	<i>Syzygium tinctorium</i> (Gagn.) Merr. ex Pierre	Va dong		Timber.			x		B14
Myrtaceae	<i>Syzygium zeylanicum</i> (L.) DC.	Ton sa mek		Edible young leaves			x		B14
Apocynaceae	<i>Tabernaemontana corumbosa</i> Roxb. ex WALL.	Phout paa		Decorative plant			x		B14
Taccaceae	<i>Tacca chantrieri</i> Andre.	Poum mien		Decorative plant			x		B14
Caesalpinioideae	<i>Tamarindus indica</i> L.	Mak kham		Timber. Edible fruit and young shoot			x		B14
Asteraceae	<i>Taraxocum officinalis</i> (L.) Web	Sa nad		Medicinal plant			x		B14
Verbenaceae	<i>Tectona grandis</i> L.F.	Mai sak		Good timber			x		B14
Combretaceae	<i>Terminalia bellirica</i> (Gaerth.) Roxb.	Mai hen		Timber			x		B14
Combretaceae	<i>Terminalia</i> spp.	Ban Loat		Food	x				B27
Dilleniaceae	<i>Tetracera indica</i> (Chr.& Pans.) Merr.	San khua		Decorative plant			x		B14
Datisceae	<i>Tetrameles nudiflora</i> R.Br.	Mai phoung		Timber		x	x		B14; B27
Vitaceae	<i>Tetragium crassipes</i> Plach.	Khua houn pae		Stem can be used for string making			x		B14
Thelypteridaceae	<i>Thelypteris nudata</i> (Roxb.) Morton	-		Decorative fern			x		B14
Malvaceae	<i>Thespesia lampas</i> (Cav.) Dalz. & Gibbs.	Po lom pom		Stem used for firewood			x		B14
Apocynaceae	<i>Thevetia peruviana</i> (Pers.) Merr.	Ka dan nga		Decorative plant			x		B14
Acanthaceae	<i>Thunbergia grandiflora</i> (Rottl.) Roxb.	Khua nam nae		Decorative plant			x		B14

Poaceae	<i>Thysanolaena maxima</i> Ktze.	Khaem		Inflorescences can be used for broom making		x	x			B14; B27
Menidpermaceae	<i>Tiliacora triandra</i>	Kheua Ya Nang		Building materials		x				B27
Rutaceae	<i>Toddalia asiatica</i> (L.) Lamk.	Khua ngu hua		Medicinal plant			x			B14
Ulmaceae	<i>Trema orientalis</i> (L.) BL.	Po hu		Stem used for firewood making			x			B14
Araliaceae	<i>Trevesia sphearocarpa</i> Glushv. & Skvorts	Tang nhai		Decorative			x			B14
Cucurbitaceae	<i>Trichosanthes tricuspidata</i> Lour.	Mak khee ka		Poisonous plant			x			B14
Araceae	<i>Typhonmium flagelliforme</i> (Lodd.) BL.	Born		Decorative plant			x			B14
Rubiaceae	<i>Uncaria macrophylla</i> Wall.in Roxb.	Nam ko bai nhai		Medicinal plant			x			B14
Rubiaceae	<i>Uncaria scadens</i> (Smith.) Hutch.	Khua nam ko		Medicinal plant			x			B14
	<i>Unknown sc.name</i>	Mai so ngong		Timber			x			B14
Papilionoideae	<i>Uraria crinata</i> Desv.	Hang sua		Decorative plant			x			B14
Malvaceae	<i>Urena lobata</i> L.	Khee on		Medicinal plant			x			B14
Annonaceae	<i>Uvaria macrophylla</i>	Khua phi phon		-			x			B14
Rhamnaceae	<i>Ventilago paucifolia</i> pit.	Khua ngou hau		Decorative plant			x			B14
Asteraceae	<i>Vernonia cinerea</i> (L.) Less	Nha thon phid		Decorative plant			x			B14
Asteraceae	<i>Vernonia volkameriaefolia</i> Wall ex DC.	Nha thod phit		Medicinal plant			x			B14
Loranthaceae	<i>Viscum heyneanum</i> DC.	Ka fak tieu		Decorative plant			x			B14
Verbenaceae	<i>Vitex peduncularis</i> Wall.	Tin nok		Timber			x			B14
Verbenaceae	<i>Vitex pinnata</i> L.	Tin nok		Timber			x			B14
Rubiaceae	<i>Wendlandia tinctoria</i> (Roxb.) DC.	Mai kao		Stem used for firewood making			x			B14
Apocynaceae	<i>Wrightia pubescens</i> R.Br.	Mai mouk		Timber			x			B14
Sapindaceae	<i>Xerospermum moronhianum</i> or <i>Nephelium hypoleucum</i>	Mak Khor Laen / Mark Ngaew		Food	x					B27
Sapindaceae	<i>Xerospermum moronhiartum</i> (BL.) BL.	Mak ngeo		Timber. Edible fruit			x			B14
Mimosoideae	<i>Xylia xylocarpa</i> (Roxb.) Taubert.	Mai deng		Good timber	x		x			B14; B27
Rutaceae	<i>Zanthoxylum rhetsa</i>	Mai Khaen		Building materials	x	x				B27
Poaceae	<i>Zea mays</i> Linn.	Sa li		Edible fruit			x			B14
Zingiberaceae	<i>Zingiber officinalis</i> Roscoe.	Khing		Medicinal plant. Edible tube			x			B14
	<i>Zygygium cuminii</i>	Mai Va				x				B27
Rhamnaceae	<i>Zyziphus mauritiana</i> Lamk.	Mak ka thun		Edible fruit			x			B14

Annex 4.2: Birds

Birds recorded during previous studies in the project area									
Common Name	Scientific Name	IUCN Redlist	Location	Savannah		Salavan		Source	
				PX H	DP V	N on - P A	XS	Non-PA	
Scaly-breasted Partridge	<i>Aborophila chloropus/A. charltonii</i>		Phou Thengkham, Phou Xang He and surrounding areas, Xe Sap (southern border)	X		X	X	B14, B20, B45	
Rufous-faced Warbler	<i>Abroscopus albogularis</i>		Western Xe Sap (mountain areas)				X	B46	
Yellow-bellied Warbler	<i>Abroscopus superciliosus</i>		Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas), Xe Sap	X			X	B20, B46, B47	
Shikra	<i>Accipiter badius</i>		Nam Kok river, Phou Thenghham; Phou Xang He and surrounding areas; Xe Sap (southern border), The Dakchung Plateau; Western Xe Sap (mountain areas)	X		X	X	X	B14, B20, B45, B46
Japanese Sparrowhawk	<i>Accipiter gularis</i>		Outside Sepon Project Area	-		-			B14
Crested Goshawk	<i>Accipiter trivirgatus</i>		Phou Xang He and surrounding areas; The Dakchung Plateau, Western Xe Sap (mountain areas); Nam Kok West	X			X	X	B20, B45, B46; B10; B14
Besra	<i>Accipiter virgatus</i>		Nalou, The Dakchung Plateau, Western Xe Sap (mountain areas)			X			B14, B45, B46
Crested Myna	<i>Acridotheres cristatellus</i>		Phou Xang He and surrounding areas; Nam Kok West, The Dakchung Plateau, Western Xe Sap (mountain areas); Xe Sap	X		X	X		(B10, B20), B14, B45, B46, B47
White-vented Myna	<i>Acridotheres javanicus</i>		Phou Xang He and surrounding areas	X					B20
Common Myna	<i>Acridotheres tristis</i>		Phou Xang He and surrounding areas; Outside Sepon Area, The Dakchung Plateau, Xe Sap	X		X	X		(B10, B20), B14, B45, B47
Black-crowned Barwing'	<i>Actinodura sodangorum</i>	V	Dakchung Plateau					X	B45
Common Sandpiper	<i>Actitis hypoleucos</i>		Phou Xang He and surrounding areas; Xe Sap (southern border)	X			X		B10, B45
Steaked Spiderhunter	<i>Aeacnothera magna</i>		Western Xe Sap (mountain areas)				X		B46
Black-throated tit	<i>Aegithalos concinnus</i>		Dakchung Plateau, Phou Ahyon, Xe Sap				X	X	B33, B45, B47
Green Iora	<i>Aegithina lafresnayei</i>		Outside Sepon Project Area	-		-			B14
Common Iora	<i>Aegithina tiphia</i>		Nam Kok East, Khanong, Xe Sap (southern border), Phou Xang He	X		X	X		B14, B20, B45, B46
Great Iora	<i>Aegithina viridissima</i>		Phou Xang He and surrounding areas;	X					(B10, B20),

Fork-tailed sunbird	<i>Aethopyga christinae</i>	Dakchung Plateau				X	B33, B45
Gould's Sunbird	<i>Aethopyga gouldiae</i>	Xe Sap				X	B47
Mrs Gould's Sunbird	<i>Aethopyga gouldiae</i>	Xe Sap (southern border), Western Xe Sap (mountain areas), The Dakchung Plateau				X X	B45, B46
Green -tailed Sunbird	<i>Aethopyga nipalensis</i>	Xe Sap; The Dakchung Plateau				X	B45; B46;B47
Black-throated Sunbird	<i>Aethopyga saturata</i>	Xe Sap (southern border), Western Xe Sap (mountain areas)				X	B45, B46
Crimson Sunbird	<i>Aethopyga siparaja</i>	Phou Xang He and surrounding areas; Outside Sepon Project Area, Western Xe Sap (mountain areas)	X		-	X	(B10, B20), B14, B46
Blue-eared Kingfisher	<i>Alcedo meninting</i>	Phou Xang He and surrounding areas	X				B10, B20
Blyth's kingfisher	<i>Alcedo hercules</i>	Xe Sap (southern border), Western Xe Sap (mountain areas)				X	B33, B46
Brown-capped Fulvetta	<i>Alcippe brunnea</i>	Xe Sap				X	B47
Rufous-winged Fulvetta	<i>Alcippe castaneiceps</i>	Xe Sap (southern border), Western Xe Sap (mountain areas), The Dakchung Plateau; Xe Sap				X X	B45; B46, B47
Black-browed Fulvetta	<i>Alcippe grotei</i>	Discovery, Xe Sap (southern border), Western Xe Sap (mountain areas)				X X	B14, B45, B46
Mountain Fulvetta	<i>Alcippe peracensis</i>	Phou Xang He and surrounding areas; Dakchung Plateau, Phou Ahyon, Xe Xap; Xe Sap (southern border), Western Xe Sap (mountain areas), Xe Sap	X			X X	B20, B33, B45, B46, B47
Spectacled Fulvetta	<i>Alcippe reficapilla</i>	Phou Ahyon, Xe Sap				X	B33, B47
Rufous-throated fulvetta	<i>Alcippe rufogularis</i>	Phou Xang He and surrounding areas	X				B20
Common Kingfisher	<i>Alcido atthis</i>	Phou Xang He and surrounding areas; Nam Kok river, Phou Thenggham, Xe Sap (southern border), Western Xe Sap (mountain areas)	X		X X	X	(B10, B20), B14, B45, B46
Puff-throated Bulbul	<i>Alophoixus pallidus</i>	Nalou, Nam Kok East, Discovery, Discovery West, Khangong, Nam Kok River; Xe Sap (southern border)				X X	B14, B45
White-Breasted Waterhen	<i>Amauromis phoenicurus</i>	Outside Sepon Project Area, Phou Xang He and surrounding areas; Western Xe Sap (mountain areas)	X		-	X	B14, B20, B45, B46
Golden-crested myna	<i>Ampeliceps coronatus</i>	Phou Xang He and surrounding areas	X				B10, B20
Rusty-cheeked Hornbill	<i>Anorrhinus tickelli</i>	Phou Thenggham				X	B14
Oriental Pied Hornbill	<i>Anthracoceros albirostris</i>	Phou Thenggham, Phou Xang He and surrounding areas, Xe Sap (southern border) ,The Dakchung Plateau	X		X X	X X	B14, B20, B45
Brown-throated sunbird	<i>Anthreptes malacensis</i>	Khanong				X	B14
Ruby-cheeked Sunbird	<i>Anthreptes singalensis</i>	Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas)	X			X	B10, B20, B45, B46
Olive-backed Pipit	<i>Anthus hodgsoni</i>	Nam Kok West, Western Xe Sap (mountain areas)				X X	B14, B46
Richard's pipit	<i>Anthus novaeseelandiae</i>	Nam Kok West, Phou Xang He and surrounding areas	X				B14, B20,

Paddvifield Pipit	<i>Anthus rufulus</i>	Outside Sepon Project Area, The Dakchung Plateau, Western Xe Sap (mountain areas), Xe Sap	-	-	X	X	B14, B45, B46, B47
Fork-tailed Swift	<i>Apus pacificus</i>	Western Xe Sap (mountain areas); Phou Xang He and surrounding areas	X		X		B46; B10
Little Spiderhunter	<i>Arachnothera longirostra</i>	Phou Xang He and surrounding areas, Xe Sap (southern border), Western Xe Sap (mountain areas)	X		X		B20, B45, B46
Streaked Spiderhunter	<i>Arachnothera magna</i>	Khanoung, Phou Thengkham; Phou Xang He and surrounding areas, Dakchung Plateau, Xe Sap	X	X	X	X	B14, B20, B33
Bar-backed Partridge	<i>Arborophila brunneopectus</i>	Phou Xang He and surrounding areas; Dakchung Plateau, Phou Ahyon, Xe Xap; Xe Sap (southern border), Western Xe Sap (mountain areas)	X		X	X	B20, B33, B45, B46, B47
Rufous-throated Partridge	<i>Arborophila rufogularis</i>	Phou Thengkham, Phou Xang He and surrounding areas, Xe Sap, Xe Sap (southern border), Western Xe Sap (mountain areas)	X	X	X		B14, B33, B45, B46
Grey Heron	<i>Ardea cinerea</i>	Phou Xang He and surrounding areas	X				B10, B20
Purple Heron	<i>Ardea purpurea</i>	Phou Xang He and surrounding areas	X				B10
Chinese pond heron	<i>Ardeola bacchus</i>	Phou Xang He and surrounding areas; Nam Kok river, Xe Sap (southern border) ,The Dakchung Plateau, Western Xe Sap (mountain areas);Xe Sap	X	X	X	X	(B10, B20), B14, B45, B46, B47
Ashy Woods swallow	<i>Artamus fuscus</i>	Phou Xang He and surrounding areas; Western Xe Sap (mountain areas); Xe Sap	X		X		B20, B33, B46, B47
Spotted Owlet	<i>Athene brama</i>	Phou Xang He and surrounding areas	X				B10, B20
Black Baza	<i>Aviceda leuphotes</i>	Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas)	X		X		B20, B45, B46
Hodgson's frogmouth	<i>Batrachostomus hodgsoni</i>	Dakchung Plateau				X	B33, B45
Bay Woodpecker	<i>Blythipicus pyrrhotis</i>	Phou Xang He and surrounding areas; Nam Kok East, Phou Thengkham; Dakchung Plateau, Phou Ahyon; Xe Sap	X	X	X	X	(B10, B20), B14, B33, B45, B47
Lesser Shortwing	<i>Brachyteryx leucophrys</i>	Western Xe Sap (mountain areas)				X	B46
Spot-bellied Eagle Owl	<i>Bubo nipalensis</i>	Western Xe Sap (mountain areas), The Dakchung Plateau, Xe Sap				X	X B45, B46
Great Hornbill	<i>Bucerros bicornis</i>	Phou Xang He and surrounding areas; Outside Sepon Project Area, Xe Sap (southern border), Western Xe Sap (mountain areas)	X	X	X		B10, B14, B45, B46
Grey-faced Buzzard	<i>Butastur indicus</i>	Western Xe Sap (mountain areas), The Dakchung Plateau				X	X B45, B46
Rufous-winged Buzzard	<i>Butastur liventer</i>	Phou Xang He and surrounding areas	X				B10, B20
Little Green/Striated Heron	<i>Butorides striatus</i>	Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau; Nam Kok river	X	X	X	X	B14; B20, B45
Plaintive cuckoo	<i>Cacomantis merulinus</i>	Phou Xang He and surrounding areas, Western Xe Sap (mountain areas)	X		X		B20, B46
Banded Bay Cuckoo	<i>Cacomantis soneratii</i>	Phou Xang He and surrounding areas; Xe Sap	X		X		B20; B47

Indian nightjar	<i>Caprimulgus asiaticus</i>	Outside Sepon Project Area	-	-			B14
Grey Nightjar	<i>Caprimulgus indicus</i>	Western Xe Sap (mountain areas)			X		B46
Large-tailed nightjar	<i>Caprimulgus macrurus</i>	Phou Thengkham, Phou Xang He and surrounding areas, Xe Sap (southern border), Western Xe Sap (mountain areas)	X	X	X		B14, B20, B45, B46
Corel-billed gound-cuckoo	<i>Carpococcyx renauldi</i>	Phou Xang He and surrounding areas	X				B10
Rufous Woodpecker	<i>Celeus brachyurus</i>	Phou Xang He and surrounding areas;The Dakchung Plateau, Western Xe Sap (mountain areas)	X		X	X	B20, B45, B46
Lesser Coucal	<i>Centropus bengalensis</i>	Phou Xang He and surrounding areas, Xe Sap	X		X		B20, B47
Greater Coucal	<i>Centropus sinensis</i>	Phou Xang He and surrounding areas; Nalou, Nam Kok West, Xe Sap (southern border), The Dakchung Plateau, Western Xe Sap (mountain areas); Xe Sap	X	X	X	X	(B10, B20), B14, B45, B46, B47
Bush-Warbler	<i>Cettia sp</i>	Nalou			X		B14
Stub-tailed Bush Warbler	<i>Cettia squameiceps</i>	Phou Xang He and surrounding areas	X				B20
Oriental Dwarf Kingfisher	<i>Ceyx erthacus</i>	Phou Xang He and surrounding areas	X				B10, B20
Emerald Dove	<i>Chalcophaps indica</i>	Phou Xang He and surrounding areas; Phou Thengkham; Xe Sap (southern border) ,The Dakchung Plateau, Western Xe Sap (mountain areas)	X	X	X	X	(B10, B20), B14, B45, B46
Little Ringed Plover	<i>Charadrius dubius</i>	Xe Sap (southern border)				X	B45
Blue-winged Leafbird	<i>Chloropsis cochinchinensis</i>	Phou Xang He and surrounding areas; Phou Thengkham; Xe Sap (southern border)	X	X	X		(B10, B20), B14, B45
Orange-bellied leafbird	<i>Chloropsis hardwickii</i>	Phou Thengkham			X		B14
Violet Cuckoo	<i>Chrysococcyx xanthorhynchus</i>	Phou Xang He and surrounding areas	X				B20
Greater Flameback	<i>Chrysocolaptes lucidus</i>	Phou Xang He and surrounding areas	X				B10, B20
White-tailed Robin	<i>Cinclidium leucurum</i>	Nam Kok East, Phou Ahyon, Xe Sap;Western Xe Sap (mountain areas), Xe Sap		X	X		B14, B33, B46, B47
Common Green Magpie	<i>Cissa chinensis</i>	Nam Kok West, Discovery, Xe Sap (southern border) ,The Dakchung Plateau; Phou Xang He and surrounding areas;	X	X	X	X	B14, B45; B47; B10
Bright-headed Cisticola	<i>Cisticola exilis</i>	Dakchung Plateau				X	B45
Chestnut-winged Cuckoo	<i>Clamator coromandus</i>	Phou Xang He and surrounding areas; Western Xe Sap (mountain areas)	X		X		B10, B20; B46
Green Cochoa	<i>Cochoa viridis</i>	Xe Sap; Phou Ahyon			X		B47; B33
Swiftlet	<i>Collocalia sp</i>	Discovery			X		B14
White-rumped shama	<i>Copsychus malabaricus</i>	Nalou, Nam Kok West, Nam Kok East, Discovery West, Khangong; Phou Xang He and surrounding areas, Western Xe Sap (mountain areas)	X	X	X		B14, B20, B46

Oriental Magpie Robin	<i>Copsychus saularis</i>	Nalou, Nam Kok River; Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau	X		X	X	X	B14, B20, B45
Large Cuckooshrike	<i>Coracina macei</i>	Phou Xang He and surrounding areas; Xe Sap (southern border),The Dakchung Plateau; Western Xe Sap (mountain areas), Xe Sap	X			X	X	B20, B45, B46, B47
Black-winged Cuckooshrike	<i>Coracina melaschista</i>	Phou Thengkham; Phou Xang He and surrounding areas; Xe Sap (southern border)	X		X	X		B14, B20 , B45
Indian Roller	<i>Coracias benghalensis</i>	Phou Xang He and surrounding areas; Nam Kok West; Xe Sap (southern border) ,The Dakchung Plateau; Western Xe Sap (mountain areas)	X		X	X	X	B10, B14, B45, B46
Large-billed Crow	<i>Corvus macrohynchos</i>	Outside Sepon Project Area, Xe Sap (southern border) ,The Dakchung Plateau; Western Xe Sap (mountain areas), Xe Sap	-		-	X	X	B14, B45, B46, B47
Dusky Broadbill	<i>Corydon sumatranus</i>	Phou Xang He and surrounding areas	X					B10, B20
Puff-throated bulbul	<i>Criniger pallidus</i>	Phou Xang He and surrounding areas	X					B20
Racket-tailed treepie	<i>Crypsirina temia</i>	Outside Sepon Project Area, Phou Xang He and surrounding areas, Xe Sap (southern border), Western Xe Sap (mountain areas)	X		-	X		B14, B20, B45, B46
Indian Cuckoo	<i>Cuculus micropterus</i>	Phou Xang He and surrounding areas; Western Xe Sap (mountain areas), Xe Sap	X			X		B20, B46, B7
Grey-headed Canary Flycatcher	<i>Culicicapa ceylonensis</i>	Phou Xang He and surrounding areas; Nalou, Nam Kok West, Nam Kok East, Discovery, Khangong, Phou Thengkham; Xe Sap (southern border), The Dakchung Plateau; Western Xe Sap (mountain areas); Xe Sap	X		X	X	X	(B10, B20); B14; B45; B46; B47
Curtia	<i>Cutia nipalensis</i>	Phou Ahyon, Xe Sap					X	B33, B47
Blue-and white Flycatcher	<i>Cyanoptila cyanomelana</i>	Phou Xang He and surrounding areas	X					B10, B20
Blue-throated Flycatcher	<i>Cyornis rubeculoides</i>	Phou Xang He and surrounding areas; Western Xe Sap (mountain areas)	X			X		B10, B20, B46
Pale Blue Flycatcher	<i>Cyornis unicolor</i>	Nam Kok West, Western Xe Sap (mountain areas)				X	X	B14, B46
Hill Blue Flycatcher	<i>Cyornis banyumas</i>	Xe Sap (southern border)					X	B45
white-tailed Flycatcher	<i>Cyornis concretus</i>	Khanong				X		B14
Hainan Blue Flycatcher	<i>Cyornis hainana</i>	Phou Xang He and surrounding areas	X					B10, B20
Hill Tickell's Blue Flycatcher	<i>Cyornis tickelliae</i>	Khanong, Phou Xang He and surrounding areas	X		X			B14, B20
Asian palm swift	<i>Cypsiurus balasiensis</i>	Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau; Western Xe Sap (mountain areas)	X			X	X	B10, B45, B46
Grey treepie	<i>Dendrocitta formosae</i>	Nam Kok West				X		B14
Rufous Treepie	<i>Dendrocitta vagabunda</i>	Xe Sap (southern border)					X	B45

Stripe-breasted woodpecker	<i>Dendrocopos atratus</i>	Dakchung Plateau, Phou Ahyon; Xe Sap (southern border), Western Xe Sap (mountain areas), Xe Sap	X	X			B33, B45, B46, B47	
Grey-capped Woodpecker	<i>Dendrocopos canicapillus</i>	Xe Sap (southern border) ,The Dakchung Plateau				X	X	B45
Forest Wagtail	<i>Dendronanthus indicus</i>	Phou Xang He and surrounding areas	X					B10, B20
Thick-billed Flowerpecker	<i>Dicaeum agile</i>	Phou Xang He and surrounding areas	X					B20
Plain Flowerpecker	<i>Dicaeum concolor</i>	Phou Xang He and surrounding areas, Xe Sap (southern border)	X			X		B20; B45
Scarlet backed flowerpecker	<i>Dicaeum cruentatum</i>	Phou Xang He and surrounding areas	X					B10
Buff-bellied Flowerpecker	<i>Dicaeum ignipectus</i>	Xe Sap				X		B47
Fire-breasted Flowerpecker	<i>Dicaeum ignipectus</i>	Xe Sap (southern border), Western Xe Sap (mountain areas), The Dakchung Plateau				X	X	B45, B46
Bronzed drongo	<i>Dicrurus aeneus</i>	Phou Xang He and surrounding areas	X					B10
Bronzed Drongo	<i>Dicrurus aeneus</i>	Phou Xang He and surrounding areas; Discovery, Xe Sap (southern border), Western Xe Sap (mountain areas);Xe Sap	X		X	X		(B10, B20), B14, B45, B46, B47
Crow-billed Drongo	<i>Dicrurus annectans</i>	Phou Xang He and surrounding areas; Nalou, Discovery, Phou Thengkham	X		X			(B10, B20), B14
Hair-Crested Drongo	<i>Dicrurus hottentottus</i>	Phou Xang He and surrounding areas; Outside Sepon Project Area; Xe Sap (southern border), Western Xe Sap (mountain areas)	X		-	X		B10, B20; B14; B45; B46
Ashy Drongo	<i>Dicrurus leucophaeus</i>	Phou Xang He and surrounding areas; Nalou, Xe Sap (southern border); The Dakchung Plateau, Western Xe Sap (mountain areas); Xe Sap	X		X	X	X	B10, B14, B20, B45, B46, B47
Black Drongo	<i>Dicrurus macrocercus</i>	Phou Xang He and surrounding areas	X					B10, B20
Greater Racket-tailed Drongo	<i>Dicrurus paradiseus</i>	Phou Xang He and surrounding areas; Nam Kok West, Nam Kok river, Phou Thengkham; Xe Sap (southern border)	X		X	X		(B10, B20), B14, B45
Lesser Recket-tailed Drongo	<i>Dicrurus remifer</i>	Nalou, Nam Kok West, Khanong; Phou Xang He and surrounding areas; The Dakchung Plateau, Western Xe Sap (mountain areas), Xe Sap	X		X	X		B14, B20, B45, B46, B47
Common Flameback	<i>Dinopium javanense</i>	Phou Xang He and surrounding areas; Western Xe Sap (mountain areas)	X			X		B10, B20, B46
Green Imperial-Pigeon	<i>Ducula aenea</i>	Nam Kok West			X			B14
Mountain Imperial Pigeon	<i>Ducula badi</i>	Phou Xang He and surrounding areas; The Dakchung Plateau, Western Xe Sap (mountain areas), Xe Sap	X			X	X	B10, B20, B45, B46, B47
Black-shouldered Kite	<i>Elanus caeruleus</i>	Phou Xang He and surrounding areas, Western Xe Sap (mountain areas); The Dakchung Plateau, Xe Sap	X			X	X	(B10, B46), B45, B47
White-crowed Forktail	<i>Enicurus leschenaulti</i>	Phou Xang He and surrounding areas; Western Xe Sap	X			X		B20, B46

		(mountain areas)							
Slaty-backed Forktail	<i>Enicurus schistaceus</i>	Phou Xang He and surrounding areas; Outside Sepon Project Area, Dakchung Plateau, Phou Ahyon, Xe Xap; Western Xe Sap (mountain areas)	X		X	X	X		B10, B14, B33, B46
Asian koel	<i>Eudynamis scolopacea</i>	Nam Kok East, Western Xe Sap (mountain areas); Phou Xang He and surrounding areas	X		X	X			B14, B46; B10; B20
Verditer Flycatcher	<i>Eumyias thalassina</i>	Nam Kok West, Phou Thengkham; Xe Sap (southern border), Western Xe Sap (mountain areas), Xe Sap			X				B14
Great Eared Nightjar	<i>Eurostopodus macrotis</i>	Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas)	X			X			B20, B45, B46
Great-eared nightjar	<i>Eurostopodus macrotis</i>	Phou Xang He and surrounding areas	X						B10
Banded Broadbill	<i>Euryslaimus javanicus</i>	Phou Xang He and surrounding areas	X						B20
Dollarbird	<i>Eurystomus orientalis</i>	Phou Xang He and surrounding areas	X						B20
Peregrine Falcon	<i>Falco peregrinus</i>	Western Xe Sap (mountain areas)				X			B46
Common Kestrel	<i>Falco tinnunculus</i>	Xe Sap (southern border)				X			B45
Snowy-browed flycatcher	<i>Ficedula hyperythra</i>	Western Xe Sap (mountain areas), The Dakchung Plateau, Xe Sap				X	X		B45, B46, B47
White-gorgeted flycatcher	<i>Ficedula monileger</i>	Dakchung Plateau, Phou Ahyon, Xe Xap; Xe Sap (southern border), The Dakchung Plateau; Western Xe Sap (mountain areas)				X	X		B33, B46
Mugimaki Flycatcher	<i>Ficedula mugimaki</i>	Xe Sap (southern border)				X			B45
Red-throated Flycatcher	<i>Ficedula parva</i>	Nam Kok river, Phou Xang He and surrounding areas; Xe Sap (southern border), The Dakchung Plateau; Western Xe Sap (mountain areas)	X		X	X	X		B14, B20, B46
Rufous-gorgeted flycatcher	<i>Ficedula strophiate</i>	Phou Ahyon, Xe Sap				X			B33, B47
Little Pied flycatcher	<i>Ficedula westermami</i>	Outside Sepon Project Area, Xe Sap	-		-	X			B14, B47
Chinese Francolin	<i>Francolinus pintadeanus</i>	Xe Sap				X			B47
Common Snipe	<i>Gallinago gallinago</i>	Phou Xang He and surrounding areas;	X						(B10, B20),
Pintail Snipe	<i>Gallinago stenura</i>	Dakchung Plateau					X		B45
Red Jungle fowl	<i>Gallus gallus</i>	Discovery West, Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas)	X		X	X			B14, B20, B46
White-hooded Babbler	<i>Gampsohynchus rufulus</i>	Western Xe Sap (mountain areas)				X			B46
Greater necklaced laughingthrush	<i>Garrulax pectoralis</i>	Phou Thengkham			X				B14
Black-throated Laughingthrush	<i>Garrulax chinensis</i>	Western Xe Sap (mountain areas)				X			B46
White-crested Laughing thrush	<i>Garrulax leucolophus</i>	Nalou, Nam Kok East, Discovery, Khangong; Phou Xang He and surrounding areas; Xe Sap (southern border), The Dakchung Plateau; Western Xe Sap (mountain areas), Xe Sap	X		X	X	X		B14, B20, B45, B46, B47

Grey Laughingthrush	<i>Garrulax maesi</i>		Western Xe Sap (mountain areas)				X		B46
Black-hooded Laughingthrush	<i>Garrulax milleti</i>		Xe Sap				X		B47
Red-tailed laughingthrush	<i>Garrulax milnei</i>		Dakchung Plateau, Phou Ahyon, Xe Xap; Western Xe Sap (mountain areas), Xe Sap				X	X	B33, B46, B47
Lesser-necklaced laughingthrush	<i>Garrulax monilager</i>		Phou Xang He and surrounding areas; Xe Sap (southern border)	X			X		B10; B20; B45
Eurasian Jay	<i>Garrulus glandarius</i>		Phou Xang He and surrounding areas; Western Xe Sap (mountain areas); Xe Sap	X			X		(B10, B20), B46, B47
Pale-headed Woodpecker	<i>Gecinulus grantia</i>		Phou Xang He and surrounding areas	X					B10, B20
Collared Owlet	<i>Glaucidium brodiei</i>		Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas);Xe Sap	X			X		(B10, B20), B45, B46, B47
Asian barred owlet	<i>Glaucidium cuculoides</i>		Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau, Western Xe Sap (mountain areas)	X			X	X	B20; B45, B46
Golden-fronted Leafbird	<i>Golden-fronted leafbird</i>		Phou Xang He and surrounding areas	X					B10, B20
Hill Myna	<i>Gracula religiosa</i>		Nam Kok West;Phou Xang He and surrounding areas; Xe Sap (southern border); Western Xe Sap (mountain areas)	X		X	X		B14, B20, B46
Stork-billed Kingfisher	<i>Halcyon capensis</i>		Phou Xang He and surrounding areas, Xe Sap (southern border)	X			X		B20, B45
Ruddy Kingfisher	<i>Halcyon coromanda</i>		Phou Xang He and surrounding areas	X					B10, B20
Black-capped Kingfisher	<i>Halcyon pileata</i>		Phou Xang He and surrounding areas; Nam Kok river, Xe Sap (southern border)	X		X	X		(B10, B20), B14, B45
White-throated Kingfisher	<i>Halcyon smyrnensis</i>		Nam Kok East, Phou Xang He and surrounding areas, Xe Sap (southern border) ,The Dakchung Plateau;	X		X	X	X	B14, B20, B45
Red-Headed Trogon	<i>Harpactes erythrocephalus</i>		Nam Kok East, Discovery West, Phou Thengkham; Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau; Western Xe Sap (mountain areas), Xe Sap	X		X	X	X	B14, B20, B45, B46, B47
Orange-breasted Trogon	<i>Harpactes oreskios</i>		Phou Xang He and surrounding areas	X					B10, B20
Grey-and-buff Woodpecker	<i>Hemicircus concretus</i>		Phou Xang He and surrounding areas	X					B10, B20
Heart-spotted Woodpecker	<i>Hemicircus canente</i>		Xe Sap (southern border)				X		B45
Crested Treeswift	<i>Hemiprocne coronata</i>		Phou Thengkham; Xe Sap (southern border)	-		X	X		B14, B45
Bar-winged Flycatcher-shrike	<i>Hemipus picatus</i>		Phou Xang He and surrounding areas; Western Xe Sap (mountain areas); Nalou, Nam Kok East, Phou Thengkham; Xe Sap (southern border) ,The Dakchung	X			X	X	B20; B14, B45, B46, B47

			Plateau; Xe Sap						
Ashy Bulbul	<i>Hemixos flavala</i>		Xe Sap (southern border), Western Xe Sap (mountain areas), The Dakchung Plateau				X	X	B45, B46
Rufous-backed sibia	<i>Heterophasia annectens</i>		Xe Sap				X		B47
Black-headed sibia	<i>Heterophasia melanoleuca</i>		Khanong, Phou Ahyon, Xe Sap,				X	X	B14, B33, B47
Long-tailed Sibia	<i>Heterophasia picaoides</i>		Xe Sap (southern border), Western Xe Sap (mountain areas)				X		B46, B47
Rufous-bellied Eagle	<i>Hieraatus kienerii</i>		Western Xe Sap (mountain areas)				X		B46
Hodgson's Hawk Cuckoo	<i>Hierococcyx fugax</i>		Western Xe Sap (mountain areas)				X		B46
Large Hawk-Cuckoo	<i>Hierococcyx sparveriioides</i>		Western Xe Sap (mountain areas), The Dakchung Plateau				X	X	B45, B46
White-throated Needletail	<i>Hirundapus caudacutus</i>		Outside Sepon Project Area	-		-			B14
Brown Backed Needletail	<i>Hirundopus giganteus</i>		Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas)	X			X		B10; B45; B46
Dusky Cray Martin	<i>Hirundo concolor</i>		Western Xe Sap (mountain areas)				X		B46
Red-rumped Swallow (8)	<i>Hirundo daurica</i>		Phou Xang He and surrounding areas; Nam Kok West, Western Xe Sap (mountain areas)	X		X	X		B10, B14, B46
Bam Swallow	<i>Hirundo rustica</i>		Western Xe Sap (mountain areas); Phou Xang He and surrounding areas; Phou Thengkham	X		X	X		B10, B14, B46
Wire-tailed Swallow	<i>Hirundo smithii</i>		Xe Sap (southern border)				X		B45
Striated Swallow	<i>Hirundo striolata</i>		Xe Sap (southern border)				X		B45
White-vented Needletail	<i>Hirundopus cochinchinensis</i>		Phou Xang He and surrounding areas	X					B10
Purple-naped Sunbird	<i>Hypogramma hypogrammicum</i>		Outside Sepon Project Area, Phou Xang He and surrounding areas	X		-			B14, B20
Black-naped Monarch	<i>Hypothymis azurea</i>		Phou Xang He and surrounding areas, Western Xe Sap (mountain areas); Nalou, Nam Kok West, Nam Kok East, Discovery, Phou Thengkham; Xe Sap (southern border)	X		X	X		(B10, B20, B46), B14, B45
Black bulbul	<i>Hypsipetes leucocephalus</i>		Phou Thengkham; Dakchung Plateau, Xe Sap, Western Xe Sap (mountain areas); Xe Sap (southern border)				X	X	B14, B33, B45, B46, B47
Black Bulbul	<i>Hypsipetes madagascariensis</i>		Xe Sap				X		B47
Mountain bulbul	<i>Hypsipetes mccllellandii</i>		Dakchung Plateau, Phou Ahyon, Xe Sap; The Dakchung Plateau, Western Xe Sap (mountain areas), Xe Sap				X	X	B33, B45, B46, B47
Black Eagle	<i>Ictinaetus malayensis</i>		Outside Sepon Project Area, Xe Sap (southern border); The Dakchung Plateau, Western Xe Sap (mountain areas); Xe Sap	-		-	X	X	B14, B45, B46, B47
Grey-eyed bulbul	<i>Iole propinqua</i>		Khanong, Xe Sap (southern border), The Dakchung Plateau;				X	X	X B14, B33, B45
Asian Fairy Bluebird	<i>Irena puella</i>		Phou Xang He and surrounding areas; Phou Thengkham; Xe Sap (southern border), Western Xe Sap (mountain areas)	X			X	X	B20; B14; B45, B46

Cinnamon biter	<i>Ixobrychus cinnamomeus</i>	Phou Xang He and surrounding areas	X					B10, B20
Brown Fish Owl	<i>Ketupa zeylonensis</i>	Xe Sap (southern border)				X		B45
Banded kingfisher	<i>Lacedo pulchella</i>	Phou Xang He and surrounding areas; Discovery West, Nam Kok River, Phou Thengkham	X		X			B20; B14
Burmese shrike	<i>Lanius colluriooides</i>	Outside Sepon Project Area, Xe Sap	-		-	X		B14, B47
Brown Shrike	<i>Lanius cristatus</i>	Phou Xang He, Xe Sap (southern border) ,The Dakchung Plateau	X			X	X	B45
Grey-backed Shrike	<i>Lanius tephronotus</i>	Xe Sap, The Dakchung Plateau				X	X	B45, B47
Sicer-eared Mesia	<i>Leiothrix argentarius</i>	Western Xe Sap (mountain areas)				X		B46
Siver-eared Mesia	<i>Leiothrix lutea</i>	Xe Sap (southern border) ,The Dakchung Plateau				X	X	B45
Lanceolated Warbler	<i>Locustella lanceolata</i>	Phou Xang He and surrounding areas; Xe Sap (southern border)	X			X		B10, B20, B45; B46
Scaly-breasted Munia	<i>Lonchura punctulata</i>	Xe Sap, The Dakchung Plateau				X	X	B45, B47
White-rumped Munia	<i>Lonchura striata</i>	Nam Kok East, Discovery; Phou Xang He and surrounding areas, Xe Sap (southern border), Xe Sap				X	X	B14, B20, B46, B47
Siamese Fireback	<i>Lophura diardii</i>	Phou Thengkham, Phou Xang He and surrounding areas, Dakchung Plateau	X		X		X	B14, B20, B33
Silver pheasant	<i>Lophura nycthemera</i>	Phou Xang He and surrounding areas; Outside Sepon Project Area, Dakchung Plateau, Phou Ahyon, Xe Xap; Western Xe Sap (mountain areas)	X		-	X	X	B10, B14, B33, B46
Vernal Hanging Parrot	<i>Loriculus vernalis</i>	Discovery West, Phou Xang He and surrounding areas, Xe Sap (southern border)	X		X	X		B14, B20
Siberian Blue Robin	<i>Luscinia cyane</i>	Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas)	X			X		B20, B45, B46
Rufous-tailed Robin	<i>Luscinia sibilans</i>	Dakchung Plateau					X	B45
Grey-faced Tit-Babbler (12)	<i>Macronous kelleyi</i>	Phou Xang He and surrounding areas	X					B10, B20
Striped Tit Babbler	<i>Macronous kelleyi</i>	Nalou, Nam Kok West, Nam Kok East, Khangong, Phou Thengkham; Phou Xang He and surrounding areas, Xe Sap (southern border), Western Xe Sap (mountain areas)				X	X	B14, B20, B45, B46
Barred Cuckoo-Dove	<i>Macropygia unchall</i>	Phou Xang He and surrounding areas; Western Xe Sap (mountain areas); Xe Sap	X			X		B10, B46, B47
Black-browed Barbet	<i>Magalaima oorti</i>	Dakchung Plateau; Western Xe Sap (mountain areas)				X	X	B45; B46
Scaly-crowned Babbler	<i>Malacopteron magnum</i>	Phou Xang He and surrounding areas	X					B20
Yellow-throated Marten	<i>Martes Flavigula</i>	Dakchung Plateau					X	B45
Crested Kingfisher	<i>Megaceryle lugubris</i>	Nam Kok river, Xe Sap (southern border), Western Xe Sap (mountain areas)				X	X	B14, B45, B46
Blue-eared Barbet	<i>Megalaima australis</i>	Phou Xang He and surrounding areas; Outside Sepon Project Area, Xe Sap (southern border), Western Xe Sap (mountain areas)	X		X	X		(B10, B20), B14, B45, B46

Green-eared Barbet	<i>Megalaima faiostricta</i>	Phou Xang He and surrounding areas; Xe Sap (southern border)	X			X		(B10, B20), B45
Golden-throated barbet	<i>Megalaima franklinii</i>	Dakchung Plateau, Phou Ahyon, Xe Sap, Western Xe Sap (mountain areas)				X	X	B33, B45, B46, B47
Coppersmith Barbet	<i>Megalaima haemacephala</i>	Phou Xang He and surrounding areas; Nam Kok West, Western Xe Sap (mountain areas)	X		X	X		(B10, B20), B14, B46
Moustached Barbet	<i>Megalaima incognita</i>	Phou Thengkham, Phou Xang He and surrounding areas, Xe Sap, Xe Sap (southern border), Western Xe Sap (mountain areas)	X		X	X		B14, B20, B33, B45, B46
Red-vented barbet	<i>Megalaima lagrandieri</i>	Outside Sepon Project Area, Phou Xang He and surrounding areas, Phou Ahyon, Xe Sap; Western Xe Sap (mountain areas), Xe Sap	X		-	X		B14, B20, B33, B46, B47
Lineated Barbet	<i>Megalaima lineata</i>	Nalou, Nam Kok East; Phou Xang He and surrounding areas; Dakchung Plateau, Xe Sap; Western Xe Sap (mountain areas)	X		X	X	X	B14, B20, B33, B45, B46
Great barbet	<i>Megalaima virens</i>	Phou Xang He and surrounding areas; Outside Sepon Project Area	X		-			B10, B14
Black-and-buff Woodpecker	<i>Meiglyptes jugularis</i>	Phou Xang He and surrounding areas; Phou Thengkham	X		X			(B10, B20), B14
Sultan tit	<i>Melanochlora sultanae</i>	Outside Sepon Project Area, Phou Xang He and surrounding areas	X		-			B14, B20
Chestnut-headed bee-eater	<i>Merops leschenaulti</i>	Phou Xang He and surrounding areas; Xe Sap (southern border)	X			X		B10, B45
Green Bee-eater	<i>Merops Orientalis</i>	Xe Sap (southern border) ,The Dakchung Plateau				X	X	B45
Intermediate Egret	<i>Mesophyx intermedia</i>	Xe Sap (southern border)				X		B45
Blue-winged Minia	<i>Minla cyanouroptera</i>	Phou Ahyon, Xe Sap (southern border); The Dakchung Plateau, Western Xe Sap (mountain areas); Xe Sap				X	X	B33, B45, B46, B47
Red-tailed Minla	<i>Minla ignotincta</i>	Xe Sap (southern border), Western Xe Sap (mountain areas), The Dakchung Plateau; Xe Sap				X	X	B45, B46, B47
Blue Rock Thrush	<i>Monticola solitarius</i>	Nam Kok East, Phou Xang He, Xe Sap (southern border)				X	X	B14, B20, B45
White Wagtail	<i>Motacilla alba</i>	Nam Kok West, Xe Sap (southern border)				X		B14, B45
Yellow \ Citrine Wagtail	<i>Motacilla flava</i>	Phou Xang He and surrounding areas	X					B20
Grey Wagtail	<i>Motacilla cinerea</i>	Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau; Western Xe Sap (mountain areas)	X			X	X	B10, B20; B45; B46
Asian Brown Flycatcher	<i>Muscicapa daurica</i>	Phou Xang He and surrounding areas; Western Xe Sap (mountain areas)	X			X		B20; B46
Ferruginous flycatcher	<i>Muscicapa ferruginea</i>	Nam Kok West				X		B14
Pygmy Blue flycatcher	<i>Muscicapella hodgsoni</i>	Xe Sap				X		B47
Blue Whisting Thrush	<i>Myophonus caeruleus</i>	Nam Kok river, Phou Xang He and surrounding areas; Western Xe Sap (mountain areas), Xe Sap (southern	X		X	X	X	B14, B20, B46, B45

		border) ,The Dakchung Plateau						
Streaked wren babbler	<i>Napothera brevicaudata</i>	Phou Ahyon, Xe Sap; Western Xe Sap (mountain areas), Xe Sap				X		B33, B46, B47
Eye-browed Wren Babbler	<i>Napothera epilepidota</i>	Xe Sap, The Dakchung Plateau				X	X	B45, B47
Purple sunbird	<i>Nectarinia asiatica</i>	Phou Xang He, Xe Sap (southern border)	X			X		B20, B45
Olive-backed Sunbird	<i>Nectarinia jugularis</i>	Outside Sepon Project Area, Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas)	X		-	X		B14, B20, B45, B46
Small Nihava	<i>Niltava macgrigoriae</i>	Phou Ahyon, Xe Sap				X		B33, B47
Brown Hawk Owl	<i>Ninox scutulata</i>	Phou Xang He and surrounding areas; Phou Thengkham; Xe Sap (southern border), Western Xe Sap (mountain areas)	X			X	X	(B10, B20), B14, B45, B46
Large Niltava	<i>Niltava grandis</i>	Western Xe Sap (mountain areas), The Dakchung Plateau, Xe Sap				X	X	B45, B46, B47
Blue-bearded Bee-eater	<i>Nyctyornis athertoni</i>	Phou Thengkham, Xe Sap (southern border); Phou Xang He and surrounding areas	-			X	X	(B14, B45), B20
Black-naped Oriole (10)	<i>Oriolus chinensis</i>	Phou Xang He and surrounding areas	X					B10, B20
Slender-billed oriole	<i>Oriolus tenuirostris</i>	Outside Sepon Project Area	-		-			B14
Maroon Oriole	<i>Oriolus trailli</i>	Phou Xang He and surrounding areas; Phou Thengkham; Dakchung Plateau, Phou Ahyon, Xe Sap; Xe Sap (southern border); Western Xe Sap (mountain areas); Xe Sap	X			X	X	B10, B14; B33, B45, B46, B47
Black-hooded Oriole	<i>Oriolus xanthornus</i>	Phou Xang He and surrounding areas	X					B10, B20
Dark-necked Tailorbird	<i>Orthotomis atrogularis</i>	Phou Xang He and surrounding areas; Nam Kok West, Khanong, Xe Sap (southern border)	X			X	X	(B10, B20), B14, B45
Mountain Tailorbird	<i>Orthotomis cuculatus</i>	Western Xe Sap (mountain areas), The Dakchung Plateau				X	X	B45, B46
Common Tailorbird	<i>Orthotomis sutorius</i>	Phou Xang He and surrounding areas; Nalou, Nam Kok West, Xe Sap (southern border)	X			X	X	(B10, B20), B14, B45, B46
Collared Scops Owl	<i>Otus lempiji</i>	Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau, Western Xe Sap (mountain areas)	X			X	X	(B10, B20), B45, B46
Mountain Scops Owl	<i>Otus spilocephalus</i>	Xe Sap (southern border) ,The Dakchung Plateau, Western Xe Sap (mountain areas)				X	X	B45, B46
Oriental scops-owl	<i>Otus sunia</i>	Phou Xang He and surrounding areas	X					B10
Lesser Yellownape	<i>Picus chlorolophus</i>	Xe Sap				X		B47
Grey-headed parrotbill	<i>Paradoxornis gularis</i>	Phou Ahyon				X		B33
Black-throated Parrotbill	<i>Paradoxornis nipalensis</i>	Xe Sap				X		B47
Great Tit	<i>Parus major</i>	Nam Kok river, Xe Sap (southern border)				X		B14, B45
Yellow-cheeked Tit	<i>Parus spilonotus</i>	Dakchung Plateau, Phou Ahyon, Xe Sap; Xe Sap (southern border) ,The Dakchung Plateau; Western Xe Sap (mountain areas)				X	X	B33, B45, B46

Eurasian Tree Sparrow	<i>Passer montanus</i>		Phou Xang He and surrounding areas; The Dakchung Plateau, Western Xe Sap (mountain areas); Xe Sap	X			X	X	(B10, B20), B45, B46, B47
Green peafowl	<i>Pavo muticus</i>	V	Phou Xang He and surrounding areas; Xe Sap (southern border)	X			X		B10, B45
Puff-throated Babbler	<i>Pellomeum ruficeps</i>		Discovery, Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas)	X		X	X		B14, B20, B45, B46
Buff-breasted Babbler	<i>Pellomeum tickelli</i>		Phou Xang He and surrounding areas; Discovery, Xe Sap (southern border), Western Xe Sap (mountain areas)	X		X	X		(B10, B20), B14, B45, B46
Spot-throated babbler	<i>Pellorneum albiventre</i>		Dakchung Plateau					X	B33
Short-billed minivet	<i>Pericrocotus brevirostris</i>		Phou Ahyon, Xe Sap (southern border), Western Xe Sap (mountain areas), Xe Sap				X		B33, B45, B46, B47
Long-tailed Minivet	<i>Pericrocotus ethologus</i>		Xe Sap				X		B47
Small Minivet	<i>Pericrocotus cinnamomeus</i>		Xe Sap (southern border)				X		B45
Scarlet Minivet	<i>Pericrocotus flammeus</i>		Khanoung, Phou Thengkham; Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas), Xe Sap	X		X	X		B14, B20, B45, B46, B47
Grey-chinned Minivet	<i>Pericrocotus solaris</i>		Western Xe Sap (mountain areas), The Dakchung Plateau, Xe Sap				X	X	B45, B46, B47
Ashy minivet	<i>Pericrocotus divaricatus</i>		Phou Xang He and surrounding areas; Outside Sepon Project Area	X		-			B10, B14
Crested Honey-buzzard	<i>Pernis ptilorhyncus</i>		Phou Xang He and surrounding areas; Outside Sepon Project Area, Xe Sap (southern border), Western Xe Sap (mountain areas)	X					B10
Flying squirrel	<i>Petaurista spp.</i>		Dong Phou Vieng		x				B27
Green-billed Malkoha	<i>Phaenicophaeus tristis</i>		Phou Xang He and surrounding areas; Nalou, Nam Kok East, Khanong, Phou Thengkham; Xe Sap (southern border), The Dakchung Plateau; Western Xe Sap (mountain areas)	X		X	X		B10, B14; B45; B46
Oriental Bay-Owl	<i>Phodilus badius</i>		Phou Thengkham	-		X			B14
Two-barred Warbler	<i>Phylloscopus (t.) plumbeitarus</i>		Xe Sap (southern border)				X		B45
Lemon-rumped Warbler	<i>Phylloscopus chloronotus</i>		Xe Sap (southern border)				X		B45
White-tailed leaf warbler	<i>Phylloscopus davisoni</i>		Dakchung Plateau, Phou Ahyon, Xe Sap; Western Xe Sap (mountain areas), Xe Sap				X	X	B33, B46, B47
Dusky Warbler	<i>Phylloscopus fuscatus</i>		Phou Xang He and surrounding areas; Xe Sap (southern border)	X			X		(B10, B20, B46), B45
Yellow-browed Warbler	<i>Phylloscopus inornatus</i>		Xe Sap (southern border), Western Xe Sap (mountain areas)				X		B45
Ashy-throated Leaf-warbler	<i>Phylloscopus maculipennis</i>		Phou Ahyon, Xe Sap				X		B33, B47
Blyth's Leaf Warbler	<i>Phylloscopus reguloides</i>		Phou Xang He and surrounding areas; Phou Thengkham; Xe Sap (southern border), The Dakchung Plateau, Xe Sap	X		X	X	X	(B10, B20), B14, B45, B47

Radde's Warbler	<i>Phylloscopus schwarzi</i>	Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau; Western Xe Sap (mountain areas)	X			X	X	B10, B45, B46
Greenish Warbler	<i>Phylloscopus trochiloides</i>	Phou Xang He and surrounding areas	X					B10, B20
Pale-legged Leaf-Warbler	<i>Phyllpscopus tenellipes</i>	Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas)	X			X		B10, B20, B45, B46
Inomate Warbler	<i>Phyoscopus inornatus</i>	Phou Xang He and surrounding areas	X					B20
Grey-capped Woodpecker	<i>Picoides canicapillus</i>	Xe Sap				X		B47
Grey-headed Woodpecker	<i>Picu canus</i>	Phou Xang He and surrounding areas; The Dakchung Plateau	X				X	(B10, B20); B45
Speckled piculet	<i>Picumnuc innominatus</i>	Xe Sap (southern border), Western Xe Sap (mountain areas)				X		B46, B47
Lesser Yellownape	<i>Picus brachyurus</i>	Phou Xang He and surrounding areas, The Dakchung Plateau, Western Xe Sap (mountain areas)	X			X	X	B20, B45, B46
Black-headed woodpecker	<i>Picus erythropygius</i>	Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas)	X			X		(B10, B20, B33), B45
Greater Yellownape	<i>Picus flavinucha</i>	Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau, Western Xe Sap (mountain areas); Xe Sap	X			X	X	(B10, B20), B45, B46, B47
Red-Collared Woodpecker	<i>Picus rabieri</i>	Phou Xang He and surrounding areas	X					B20
Laced Woodpecker	<i>Picus vittatus</i>	Phou Xang He and surrounding areas	X					B10, B20
Bar-bellied Pitta	<i>Pitta ellioti</i>	Phou Xang He and surrounding areas	X					B20
Pygmy wren Babbler	<i>Pnoepyga pusilla</i>	Xe Sap (southern border), Western Xe Sap (mountain areas), The Dakchung Plateau				X	X	B45, B46
Grey Peacock-Pheasant	<i>Polyplectron bicalcaratum</i>	Phou Xang He and surrounding areas; Phou Ahyon; Xe Sap	X			X		(B10, B20); B33; B47
Coral-billed Scimitar Babbler	<i>Pomatorhinus ferruginosus</i>	Xe Sap (southern border), Western Xe Sap (mountain areas)				X		B46, B47
Large Scimitar-Babbler	<i>Pomatorhinus hypoleucos</i>	Phou Xang He and surrounding areas, Western Xe Sap (mountain areas)	X			X		B20, B45
Red-billed scimitar babbler	<i>Pomatorhinus ochraceiceps</i>	Dakchung Plateau, Phou Ahyon; Xe Sap				X	X	B33, B47
White-browed Scimitar Babbler	<i>Pomatorhinus schisticeps</i>	Phou Xang He and surrounding areas, Xe Sap (southern border) ,The Dakchung Plateau	X			X	X	B20, B45
Hill Prinia	<i>Prinia atrogularis</i>	Outside Sepon Project Area, Xe Sap (southern border), The Dakchung Plateau; Western Xe Sap (mountain areas), Xe Sap	-		-	X	X	B14, B45, B46, B47
Yellow-billed prina	<i>Prinia flaviventris</i>	Nam Kok East, Discovery West, Khanong				X		B14
Plain Prinia	<i>Prinia inornata</i>	Discovery West				X		B14
Rufescent Prinia	<i>Prinia rufescens</i>	Nam Kok West, Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain	X			X	X	B14, B20, B45, B46

		areas)						
Long-tailed Broadbill	<i>Psarisomus dalhousiae</i>	Phou Xang He and surrounding areas; Western Xe Sap (mountain areas)	X			X		B10, B20, B46
Red-breasted Parakeet	<i>Psittacula alexandri</i>	Phou Xang He and surrounding areas	X					B20
Alexandrine Parakeet	<i>Psittacula eupatria</i>	Outside Sepon Project Area				-		B14
Grey-headed Parakeet	<i>Psittacula finschii</i>	Phou Xang He and surrounding areas; Nalou, Xe Sap (southern border); Western Xe Sap (mountain areas)	X		X	X		(B10, B20); B14, B45, B46
Chestnut-fronted Shrike Babbler	<i>Pteruthius aenobarbus</i>	Khanong, Xe Sap (southern border), Western Xe Sap (mountain areas);Xe Sap			X	X		B14, B45, B46, B47
White-browed Shrike Babbler	<i>Pteruthius flaviscapis</i>	Xe Sap (southern border), Western Xe Sap (mountain areas), The Dakchung Plateau; Xe Sap				X	X	B45, B46, B47
Black-eared Shrike Babbler	<i>Pteruthius melanotes</i>	The Dakchung Plateau, Xe Sap				X	X	B45
Brown hornbill	<i>Ptilolaemus tickelli</i>	Phou Xang He and surrounding areas	X					B10, B20
Black-headed Bulbul	<i>Pycnonotus atriceps</i>	Phou Xang He and surrounding areas; Nam Kok East	X		X			(B10, B20, B46), B14
Sooty-headed Bulbul	<i>Pycnonotus aurigaster</i>	Xe Sap (southern border)				X		B45
Grey-bellied Bulbul	<i>Pycnonotus cyaniventris</i>	Phou Xang He and surrounding areas; Western Xe Sap (mountain areas)	X			X		B10, B20, B46
Stripe-throated Bulbul	<i>Pycnonotus finlaysoni</i>	Nam Kok West, Phou Xang He and surrounding areas	X		X			B14, B20, B46
Falvescent bulbul	<i>Pycnonotus flavescens</i>	Phou Xang He and surrounding areas; Dakchung Plateau	X				X	B10; B33; B45
Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	Nalou, Nam Kok West, Khanong; Phou Xang He and surrounding areas, Xe Sap (southern border) ,The Dakchung Plateau, Xe Sap	X		X	X	X	B14, B20, B45, B46, B47
Black-crested Bulbul	<i>Pycnonotus melanicterus</i>	Phou Xang He and surrounding areas; Nalou, Nam Kok East, Discovery, Phou Thengkham; Xe Sap (southern border) ,The Dakchung Plateau, Western Xe Sap (mountain areas)	X		X	X		(B10, B20), B14, B45, B46
Streak-eared Bulbul	<i>Pycnonotus balanfordi</i>	Phou Xang He and surrounding areas	X					B20
Red-Legged Crane	<i>Rallina fasciata</i>	Phou Thengkham				X		B14
Crested Argus	<i>Rheinardia ocellata</i>	Xe Sap (southern border), Western Xe Sap (mountain areas); Xe Sap				X		B45, B46, B47
White-throated Fantail	<i>Rhipidura albicollis</i>	Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau; Western Xe Sap (mountain areas), Xe Sap	X				X	B10, B45, B46, B47
Plumbeous Water Redstart	<i>Rhyacomis fuliginus</i>	Western Xe Sap (mountain areas)					X	B46
Wreathed Hornbill	<i>Rhyticeros undulatus</i>	Phou Xang He and surrounding areas	X					B20
White-browed Piculet	<i>Sasia ochracea</i>	Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas)	X			X		B20, B46
Pied bushchat	<i>Saxicola caprata</i>	Phou Xang He and surrounding areas	X					B10

Grey Bushchat	<i>Saxicola ferrea</i>		Xe Sap (southern border)			X		B45
Common Stonechat	<i>Saxicola torquata</i>		Nalou, Nam Kok West, Xe Sap (southern border) ,The Dakchung Plateau; Phou Xang He and surrounding areas	X		X	X	B14, B20; B45
Eurasian woodcock	<i>Scolopax rusticola</i>		Phou Xang He and surrounding areas	X				B10
Golden-spectacled Warbler	<i>Seicercus burkii</i>		Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau, Western Xe Sap (mountain areas); Xe Sap	X			X X	(B10, B20), B45, B46, B47
Chestnut-crowned Warbler	<i>Seicercus castaniceps</i>		Xe Sap (southern border), Western Xe Sap (mountain areas); Dakchung Plateau				X X	B45; B46, B47
Grey-cheeked Warbler	<i>Seienrcus poliogenys</i>		Dakchung Plateau, Phou Ahyon, Xe Xap; Xe Sap (southern border) ,The Dakchung Plateau; Western Xe Sap (mountain areas), Xe Sap				X X	B33; B45; B46, B47
Sliver-breasted Broadbill	<i>Serilophus lunatus</i>		Western Xe Sap (mountain areas); Phou Xang He and surrounding areas	X			X	B20,B46
Chestnut-bellied Nuthatch	<i>Sitta castanea</i>		Phou Xang He and surrounding areas	X				B10, B20
Velvet-fronted Nuthatch	<i>Sitta frontalis</i>	V	Phou Thengksam, Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau; Western Xe Sap (mountain areas), Xe Sap	X		X	X	B14, B20, B45, B46, B47
Crested serpent Eagle	<i>Spilornis cheela</i>		Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau, Western Xe Sap (mountain areas); Xe Sap	X			X X	B20, B45, B46, B47
Changeable Hawk Eagle	<i>Spizaetus cirrhatus</i>		Outside Sepon Project Area, Xe Sap (southern border)	-		-	X	B14, B45
Mountain Hawk Eagle	<i>Spizaetus nipalensis</i>		Xe Sap (southern border)				X	B45
Golden Babbler	<i>Stachyris Chrysaea</i>		Xe Sap (southern border), Western Xe Sap (mountain areas), The Dakchung Plateau; Xe Sap				X X	B45, B46, B47
Grey-throated Babbler	<i>Stachyris nigriceps</i>		Phou Xang He and surrounding areas; Xe Sap (southern border), The Dakchung Plateau; Western Xe Sap (mountain areas), Xe Sap	X			X X	(B10, B20); B45; B46, B47
Rufous-capped babbler	<i>Stachyris ruficeps</i>		Dakchung Plateau, Phou Ahyon;Xe Sap				X X	B33, B47
Rufous-fronted Babbler	<i>Stachyris rufifrons</i>		Nalou, Khanong; Western Xe Sap (mountain areas)				X X	B14, B46
Spotted Dove	<i>Streptopelia chinensis</i>		Nam Kok West, Nam Kok East, Discovery; Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau; Western Xe Sap (mountain areas); Xe Sap	X		X	X	B14, B20, B45, B46, B47
Oriental Turtle Dove	<i>Streptopelia orientalis</i>		Nam Kok West, Phou Xang He and surrounding areas, Xe Sap (southern border) ,The Dakchung Plateau; Western Xe Sap (mountain areas), Xe Sap	X			X X	B14, B20, B45, B46, B47
Red turtle-dove	<i>Streptopelia tranquebarica</i>		Phou Xang He and surrounding areas; Nalou	X		X		B10; B14

Yellow-billed Nuthatch	<i>Sitta solangiae</i>	Western Xe Sap (mountain areas), The Dakchung Plateau; Xe Sap	X	X	X	B45, B46, B47
Black-collared Starling	<i>Sturnus nigricollis</i>	Phou Xang He and surrounding areas; Dakchung Plateau, Xe Sap (southern border)	X		X	(B10, B20, B46), B33, B45
Drongo Cuckoo	<i>Surniculus lugubris</i>	Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas); Xe Sap	X		X	B10, B45, B46, B47
Yellow-browed Tit	<i>Sylviparus modestus</i>	Xe Sap; Phou Ahyon			X	B33; B47
Orange-flanked Bush Robin	<i>Tarsiger cyanurus</i>	Western Xe Sap (mountain areas), The Dakchung Plateau			X	B45, B46
Ratchet-tailed Treepie (11)	<i>Temnurus temnurus</i>	Phou Xang He and surrounding areas; Western Xe Sap (mountain areas)	X		X	B20, B46
Large Woodshrike	<i>Tephrodomis gularis</i>	Phou Xang He and surrounding areas; Dakchung Plateau, Western Xe Sap (mountain areas)	X		X	B20, B45, B46
Common Woodshrike	<i>Tephrodornis pondicerianus</i>	Xe Sap (southern border)			X	B45
Asian paradise flycatcher	<i>Terpsiphone paradisi</i>	Phou Xang He and surrounding areas; Outside Sepon Project Area	X		-	B20; B14
Grey-bellied tesia	<i>Tesia cyaniventer</i>	Dakchung Plateau, Phou Ahyon, Xe Xap; Western Xe Sap (mountain areas);			X	B33, B46
Chestnut-capped babbler	<i>Timalia pileata</i>	Phou Xang He and surrounding areas	X			B10, B20
Pin-tailed Green Pigeon	<i>Treron apicauda</i>	Nalou, Phou Thengkham; Xe Sap (southern border) ,The Dakchung Plateau;			X	B14, B45
Thick-billed Pigeon	<i>Treron curvirostra</i>	Phou Thengkham, Phou Xang He and surrounding areas; Dong Phou Vieng	X	x	X	B14, B20, B27
Wedge-tailed Green-Pigeon	<i>Treron sphenura</i>	Nalou, Nam kok East			X	B14
Green Pigeon sp	<i>Treron spp.</i>	Phou Thengkham; Xe Sap (southern border)			X	B14, B46
Pin-tailed\Yellow-vented Green Pigeon	<i>Treron spp.</i>	Western Xe Sap (mountain areas)			X	B46
Abbott's Babbler	<i>Trichastoma abbotti</i>	Phou Xang He and surrounding areas	X			B20
Green Sandpiper	<i>Tringa ochropus</i>	Phou Xang He and surrounding areas; Xe Sap (southern border) ,The Dakchung Plateau	X		X	(B10, B20), B45
Eyebrowed Thrush	<i>Turdus obscurus</i>	Dakchung Plateau			X	B45
Red-billed Bule Magpie	<i>Urocissa erythrorhyncha</i>	Phou Thengkham; Xe Sap (southern border) ,The Dakchung Plateau	-		X	B14, B45
White-winged magpie	<i>Urocissa whiteheadi</i>	Xe Sap (southern border), Western Xe Sap (mountain areas)			X	B33, B46
Blue Magpie	<i>Urocissa erythrorhyncha</i>	Phou Xang He and surrounding areas	X			B10, B20
Asian Stubtail	<i>Urosphena squameiceps</i>	Western Xe Sap (mountain areas)			X	B46
Asian Stubtail	<i>Urosphena subulata</i>	Xe Sap (southern border)			X	B45
River Lapwing	<i>Vanellus duvaucelli</i>	Dakchung Plateau			X	B45
Red-wattled Lapwing	<i>Venellus indicus</i>	Phou Xang He and surrounding areas; Xe Sap (southern border), Western Xe Sap (mountain areas), Xe Sap	X		X	B20, B45, B46, B47

Striated Yuhina	<i>Yuhina castaniceps</i>		Xe Sap (southern border), Western Xe Sap (mountain areas)			X		B45, B46
White-bellied Yuhina	<i>Yuhina zantholeuca</i>		Discovery, Khanong, Phou Thengkham; Phou Xang He and surrounding areas, Phou Xang He, Xe Sap (southern border), The Dakchung Plateau; Western Xe Sap (mountain areas), Xe Sap	X	X	X		B14, B20, B45, B46, B47
Orange-headed Thrush	<i>Zoothera citrina</i>		Xe Sap (southern border)			X		B45
Scaly Thrush	<i>Zoothera dauma</i>		Phou Xang He and surrounding areas, The Dakchung Plateau	X			X	B20, B45
Dark-sided Thrush	<i>Zoothera marginata</i>		Phou Xang He and surrounding areas	X				B20
Siberian Thrush	<i>Zoothera sibirica</i>		Phou Xang He and surrounding areas	X				B20
Japanese White-eye	<i>Zosterops japonicus</i>		Dakchung Plateau				X	B45
Oriental White-eye	<i>Zosterops palpebrosus</i>		Nam Kok West, Xe Sap (southern border), Xe Sap			X		B14, B45, B47

Annex 4.3: Amphibians & Reptiles

Amphibians & Reptiles recorded during previous studies in the project area											
Scientific Name	Common Name	Status	Location			Savannakhet		Salavan		Source	
			IUCN Redlist			PXH	DPV	Non-PA	XS	Non-PA	
Amphibians											
<i>Bufo galeatus</i>	-		Western Xe Xap						X	B46	
<i>Bufo melanostictus</i>	Asian toad		Nalou, Nam Kok East, Discovery, Nam kok river					X		B14	
<i>Hoplobatrachus rugulosus</i>	Chinese Bull Frog		Western Xe Xap						X	B46	
<i>Kalophrynus pleurostigma</i>	Spotted-groin frog		Discovery West					X		B14	
<i>Kaloula mediolineata</i>	-		Western Xe Xap						X	B46	
<i>Kaloula pulchra</i>	-		Western Xe Xap						X	B46	
<i>Leptobranchium spp.</i>	-		Western Xe Xap						X	B46	
<i>Leptolalax pelodytoides</i>	-		Western Xe Xap						X	B46	
<i>Limnonectes kuhlii</i>	Marbled frog		Khanong, Phou Thengkham, Western Xe Xap					X	X	B14, B46	
<i>Limnonectes limnocharis</i>	-		Western Xe Xap						X	B46	
<i>Microhyla annamensis</i>	-		Western Xe Xap						X	B46	
<i>Microhyla berdmorei</i>	Narrow mouthed frog		The Dakchung Plateau, Western Xe Xap						X	X	B45, B46
<i>Microhyla butleri</i>	-		Western Xe Xap						X	B46	
<i>Microhyla heymosi</i>	Heymon's Frog		Nalou, Nam Kok West, Discovery, Discovery West, Khanong, Phou TheNalougkham, Western Xe Xap					X	X	B14, B46	
<i>Microhyla inornata</i>	Brown Pigmy Frog		Nalou, Nam Kok West, Discovery, Discovery West, Khanong, Phou TheNalougkham Western Xe Xap					X	X	B14, B46	
<i>Occidozyga martensi</i>	Kuhl's stream frog		Discovery					X		B14	
<i>Occidozyza lima</i>	-		Western Xe Xap						X	B46	
<i>Ophiophagus hannah</i>	King cobra		Western Xe Xap, Phou Xang He			X			X	B10, B46	
<i>Ovophis monicola</i>	-		Western Xe Xap						X	B46	
<i>Paa microlineata</i>	-		Western Xe Xap						X	B46	
<i>Philautus sp</i>	-		Western Xe Xap						X	B46	
<i>Phrynoglossus martensii</i>	-		Western Xe Xap						X	B46	
<i>Polypedates leucomystax</i>	Common tree Frog		Nam Kok river, Phou Thengkham					X		B14	
<i>Rana attigua</i>	-		Western Xe Xap						X	B46	
<i>Rana johnsi</i>	-		Western Xe Xap						X	B46	

<i>Rana lateralis</i>	Yellow frog		Discovery West			X			B14
<i>Rana livida</i>	-		Western Xe Xap				X		B46
<i>Rana macrodactyla</i>	-		Western Xe Xap				X		B46
<i>Rana nigrovittata</i>	Dark-sided frog		Nam Kok West, Discovery West, Khanong, Western Xe Xap			X	X		B10, B46
<i>Rana sp (cf.adenoleura)</i>	-		Western Xe Xap				X		B46
<i>Rhacophorus baliogaster</i>	-		Western Xe Xap				X		B46
<i>Rhacophorus bisaculus</i>	Phu kadong tree frog		Phou Thengkham, Western Xe Xap			X	X		B10, B46
<i>Rhacophorus exechopygus</i>	-		Western Xe Xap				X		B46
<i>Ichthyophis sp</i>	Ichthyophis		Western Xe Xap				X		B46
Reptiles									
<i>Acanthosaura capra</i>	-		Western Xe Xap				X		B46
<i>Ahaetulla prasina</i>	Oriental Whip Snake		Western Xe Xap, Discovery			X	X		B14, B46, B45
<i>Amolops cremnobatus</i>	-		Western Xe Xap				X		B46
<i>Amyda cartilagina</i>	Asiatic Softshell Turtle	V	Nam Kok river, Western Xe Xap			X	X		B14, B46
<i>Boiga multomaculata</i>	-		Western Xe Xap				X		B46
<i>Bungarus fasciatus</i>	-		Western Xe Xap				X		B46
<i>Calluella guttulata</i>			Nalou			X			B14
<i>Calotes emma</i>	Forest Crested Lizard		Discovery, Discovery West, Khanong, Phou Thengkham			X			B14
<i>Calotes versicolor</i>	Common Garden Lizard		Nam Kok West, Western Xe Xap, Pho Xang He	X		X	X		B14, B46, B45
<i>Cosymbotus Platyurus</i>	-		Western Xe Xap				X		B46
<i>Crocodylus siamensis</i>	Siamese Crocodile		Western Xe Xap, The Dakchung Plateau				X		B46, B45
<i>Cyclemys dentata</i>	Asian Leaf Tortoises		Nam Kok river			X			B14
<i>Cyclemys tcheponesis</i>	-		Western Xe Xap				X		B46
<i>Dendrelaphis sp</i>	-		Western Xe Xap				X		B46
<i>Draco maculatus</i>	Spotted Flying Dragon		Nam kok East, Discovery, Khanong			X			B14
<i>Dryocalamus davisanii</i>	Common Bridle Snake		Discovery			X			B14
<i>Elaphe prasina</i>	-		Western Xe Xap				X		B46
<i>Elaphe radiata</i>	-		Western Xe Xap				X		B46
<i>Gehyra mutilata</i>	-		Western Xe Xap				X		B46
<i>Gekko gekko</i>	Tokay Gecko		Nam Kok East, Discovery, Khanong, Phou Thengkham, Western Xe Xap, Pho Xang He NBCA			X	X		B14, B46, B45
<i>Glyphoglossus molossus</i>	-		Western Xe Xap				X		B46
<i>Gonyosoma oxycephalum</i>	-		Western Xe Xap				X		B46
<i>Hemidactylus frenatus</i>	Common House Gecko		Western Xe Xap			X	X		B14, B46

<i>Hemidactylus garnotii</i>	-		Western Xe Xap				X		B46
<i>Homalopsis buccata</i>	-		Western Xe Xap				X		B46
<i>Indotestudo elongata</i>	-	E	Western Xe Xap			X	X		B14, B46
<i>Lipinia sp</i>	-		Western Xe Xap				X		B46
<i>Lygosoma cf. quadrupes</i>	-		Western Xe Xap				X		B46
<i>Mabuya macularia</i>	Bronze Grass Skink		Nalou, Nam Kok West, Nam Kok East, Discovery, Discovery West, Khanong, Nam Kok river, Phou TheNalougkham, Western Xe Xap			X	X		B14, B46
<i>Mabuya multifasciata</i>	Common Sun Skink		Nalou, Nam Kok West, Discovery, Khanong, Western Xe Xap			X	X		B14, B46
<i>Manouria impressa</i>	Impressed Tortoises	V	Western Xe Xap			X	X		B14, B46
<i>Naja atra</i>	-		Western Xe Xap				X		B46
<i>Naja kaouthia</i>	Monocellate Cobra		Western Xe Xap			X	X		B14, B46
<i>Naja siamensis</i>	-		Western Xe Xap				X		B46
<i>Phyllodactylus siamensis</i>	Siamese Leaf-toed Gecko		Nam Kok West, Discovery, Discovery West, Khanong			X			B14
<i>Physignathus cocincinus</i>	Indo-Chinese Water Dragon		Khanong, Nam Kok river, Western Xe Xap			X	X		B14, B46
<i>Platysternon megacephalum</i>	Big-headed Turtle	E	Western Xe Xap				X		B46
<i>Pseudeocaloter microlepis</i>	-		Western Xe Xap				X		B46
<i>Pseudoxenodon macrops</i>	-		Western Xe Xap				X		B46
<i>Ptyas korros</i>	Indo-Chinese Rat Snake		Nam Kok river			X			B14
<i>Ptyas korros</i>	Indo-Chinese Rat Snake		Western Xe Xap, Phou Xang He	X			X		B10, B46
<i>Python molurus</i>	Burmese Python		Western Xe Xap			X	X		B10, B46
<i>Python reticulatus</i>	Reticulated python		Western Xe Xap; Phou Xang He, The Dakchung Plateau	X		X	X		B10, B45; B46
<i>Rhabdophis crysargus</i>	-		Western Xe Xap				X		B46
<i>Rhabdophis subminiatus</i>	Red-necked keelback		Nalou, Discovery, Khanong, Western Xe Xap			X	X		B10, B46
<i>Scincella reevesi</i>	Reeves' Smooth Skink		Nalou, Nam Kok West, Nam Kok East, Discovery, Discovery West, Khanong, Nam Kok river, Phou TheNalougkham			X			B14
<i>Sibynophis collaris</i>	-		Western Xe Xap				X		B46
<i>Sphenomorphus indicus</i>	Indian Forest Skink		Khanong, Phou Thengkham, Western Xe Xap			X	X		B10, B46
<i>Sphenomorphus maculatus</i>	-		Western Xe Xap				X		B46
<i>Streblus asper</i>	-		Dong Phou Vieng		X				B27
<i>Takydromus sexlineatus</i>	-		Western Xe Xap				X		B46

<i>Thysanolaena maxima</i>	-	Dong Phou Vieng		X				B27
<i>Trimeresurus albalabris</i>	White-lipped Viper	Western Xe Xap			X	X		B14; B46
<i>Tropidophorus cochinchinencis</i>	Water Skink	Discovery			X			B14
<i>Varanus bengalensis</i>	Bengal Monitor	Dong Phu Vieng, Phu Xang He, The Dakchung Plateau	X	X	X	X		B10, B45, B27;B14
<i>Varanus salvator</i>	Water monitor	Phu Xang He NBCA, The Dakchung Plateau	X			X	X	B10, B14, B45
<i>Xenochrophis piscator</i>	Water Snake	Western Xe Xap				X		B46
<i>Xenopeltis unicolor</i>		Khanong			X			B14

Annex 4.4: Freshwater Fish

Family Name	Scientific Name	Lao Name	Conservation Status - IUCN Redlist	Location	Savannakhet			Salavan		Source
					PXH	DPV	Non-PA	XS	Non-PA	
Cyprinidae	<i>Aptosyax grypus</i>	Pa sanak		Xe Bang Hiang		X				B51
Amblycipitidae	<i>Amblyceps mangois</i>	Pa khe hin		Xe Bang Hiang		X				B51
Cyprinidae	<i>Amblyrhynchichthys truncatus</i>	Pa ta lo		Xe Bang Hiang		X				B51
Dasyatida	<i>Amphostistius spp.</i>	Pa fa lai		Xe Bang Hiang		X				B51
Anabantidae	<i>Anabus testudineus</i>	Pa khen		Houay Samphan		X				B51
Anguillidae	<i>Anguilla marmorata</i>	Pa lot		Xe Bang Hiang		X				B51
Soleidae	<i>Archiroides or Euryglossa sp or spp</i>	Pa lin ma		Xe Bang Hiang		X				B51
Sisoridae	<i>Bagarius yarrelli</i>	Pa khe		Xe Bang Hiang		X				B51
Bagridae	<i>Bagrichthys macracanthus or spp</i>	Pa yang bone		Xe Bang Hiang		X				B51
Balitoridae	<i>Balitora or Homoloptera sp. Or spp</i>	Pa tit hin		Xe Bang Hieang, Xe Lanong, Houay Chaloi		X				B51
Cyprinidae	<i>Bangana behri</i>	Pa va houa no		Xe Bang Hieang, Xe Lanong, Houay Chaloi		X				B51
Cyprinidae	<i>Barbichthys nitidus</i>	-		Xe Bang Hiang		X				B51
Cyprinidae	<i>Barbodes altus or spp</i>	Pa vian fai		Xe Bang Hieang, Xe Lanong, Houay Chaloi		X				B51
Siluridae	<i>Belodontictys cf. dianema</i>	Pa khop		Xe Bang Hiang		X				B51
Sciaenidae	<i>Boesemania microlepis</i>	Pa kvang		Xe Bang Hiang		X				B51
Cyprinidae	<i>cf. Chela sp</i>	Pa sieu dang ghen		Houay Samphan		X				B51
Balitoridae	<i>cf. Nemachellus sp</i>	-		Xe Bang Hiang		X				B51
Cyprinidae	<i>cf. Oygaster sp</i>	-		Houay Samphan		X				B51
Channidae	<i>Channa marullus</i>	Pa kouan		Xe Bang Hieang, Xe Lanong, Houay Chaloi		X				B51
Channidae	<i>Channa micropeltes</i>	Pa do		Xe Bang Hieang, Xe Lanong, Houay Chaloi		X				B51
Channidae	<i>Channa orientalls</i>	Pa kang		Phou xang; Xe Bang Hieang, Xe Lanong, Houay Chaloi, Hou Palouang	X	X				B 10; B51
Channidae	<i>Channa striata</i>	Pa kho		Xe Bang Hieang, Xe Lanong, Houay Chaloi, Hou Palouang		X				B51

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Notopteridae	<i>Chitala blanci</i>	Pa memo		Xe Bang Hiang		X			B51
Notopteridae	<i>Chitala ornata</i>	Pa memo		Xe Bang Hiang, Houay Samphan		X			B51
Tetraodontidae	<i>Chonerhinus nefastus</i>	Pa pao		Xe Bang Hiang		X			B51
Cyprinidae	<i>Cirrhinus jullieni</i>	-		Xe Bang Hiang		X			B51
Cyprinidae	<i>Cirrhinus moliterella</i>	Pa keng		Xe Bang Hiang, Houay Samphan, Xe Lanong, Houay Chailoi		X			B51
Calridae	<i>Clarias batrachus</i>	Pa douk sam kang		Xe Bang Hiang, Xe Lanong, Houay Chaoi, Hou Palouang		X			B51
Claridae	<i>Clarias macrocephalus</i>	Pa douk		Phou xang		X			B 10
Calridae	<i>Clarias sp</i>	Pa douk he		Xe Bang Hiang		X			B51
Calridae	<i>Clarias sp</i>	Pa douk phan		Xe Bang Hiang		X			B51
Coiidae	<i>Coius sp or spp</i>	Pa sua		Xe Bang Hiang		X			B51
Cyprinidae	<i>Cosmocheilus harmandi</i>	Pa mak ban		Xe Bang Hiang		X			B51
Cyprinidae	<i>Cyclocheilichthys cf. apogon</i>	Pa ta sai		Xe Bang Hiang		X			B51
Cyprinidae	<i>Cyclocheilichthys cf. armatus</i>	Pa ta sai		Xe Bang Hiang, Houay Samphan		X			B51
Cyprinidae	<i>Cyclocheilichthys cf. repasson</i>	Pa ta sai		Xe Bang Hiang		X			B51
Cyprinidae	<i>Cyclocheilichthys enoplos</i>	Pa chok		Xe Bang Hiang		X			B51
Cyprinidae	<i>Cyprinus carpio</i>	Pa nai		Xe Bang Hiang		X			B51
Cyprinidae	<i>Danio cf. acqipinnatus</i>			Houay Palouang		X			B51
Cyprinidae	<i>Discerodontus ashmcadi</i>	-		Xe Bang Hiang, Houay Samphan		X			B51
Cyprinidae	<i>Epalzeorhynchus munenese</i>	-		Xe Bang Hieang, Xe Lanong, Houay Chaloi, Hou Palouang		X			B51
Cyprinidae	<i>Esomus metallics</i>	Pa sieu nong		Xe Bang hiang, Houay Samphan, Houay Kloung		X			B51
Cyprinidae	<i>Garra cf. cambodgiensis</i>	Pa kom keng		Xe Bang Hiang		X			B51
Cyprinidae	<i>Garra sp.or spp</i>	Pa hang khiko		Xe Bang Hiang		X			B51
Sisoridae	<i>Glyptothorax sp</i>					X			B51
Gyrinocheilidae	<i>Gyrinocheilus pennocki</i>	Pa ko		Xe Bang Hiang		X			B51
Cyprinidae	<i>Hampala dispar</i>	Pa sout		Xe Bang Hiang, Houay Samphan, Xe Lanong, Houay Chailoi		X			B51
Pangasilidae	<i>Hellcophagus waandersi</i>	Pa hoi		Xe Bang Hiang, Houay Samphan		X			B51
Bagridae	<i>Hemibagrus sp.</i>	Pa kot		Phou xang		X			B 10
Siluridae	<i>Hemisilurus mekongensis</i>	Pa nang deng		Xe Bang Hiang		X			B51
Cyprinidae	<i>Henicorhynchus lobatus</i>	Pa ka bo		Xe Bang Hiang, Houay Samphan		X			B51
Cyprinidae	<i>Henicorhynchus siamensis</i>	Pa ka bo hua kheng		Xe Bang Hiang		X			B51
Dasyatida	<i>Himantura chaophraya</i>	Pa fa lai		Xe Bang Hiang		X			B51

Cyprinidae	<i>Hypsibarbus cf. malcolmi</i>	Pa Pak nouat		Xe Bang Hiang, Houay Samphan, Xe Lanong, Houay Chailoi	X				B51
Cyprinidae	<i>Hypsibarbus lagleri</i>	Pa pak home		Xe Bang Hiang	X				B51
Cyprinidae	<i>Hypsibarbus sp</i>	Pa va khai		Xe Bang Hiang	X				B51
Siluridae	<i>Kryptoerus cf. bicirrhis</i>	Pa Pikai (k)		Dong Phou Vieng	X				B27
Siluridae	<i>Kryptoerus cf. cheveyi</i>	Pa Pikai (k)		Dong Phou Vieng	X				B27
Siluridae	<i>Kryptoerus cf. cryptopterus</i>	Pa Pikai (k)		Dong Phou Vieng	X				B27
Siluridae	<i>Kryptoerus cf. hexapterus</i>	Pa Gi (k)		Dong Phou Vieng	X				B27
Siluridae	<i>Kryptoerus cf. limpok</i>	Pa Pikai (k)		Dong Phou Vieng	X				B27
Siluridae	<i>Kryptoerus cf. moorei</i>	Pa Pikai (k)		Dong Phou Vieng	X				B27
Siluridae	<i>Kryptoerus cf. schibeides</i>	Pa Pikai (k)		Dong Phou Vieng	X				B27
Siluridae	<i>Kryptopterus spp</i>	Pa pik kai		Xe Bang Hiang	X				B51
Cyprinidae	<i>Labeo erythropterus</i>	Pa va khai		Xe Bang Hiang	X				B51
Cyprinidae	<i>Labiobarbus leptocheilus</i>	Pa khoui lam		Xe Bang Hiang, Houay Samphan	X				B51
Cyprinidae	<i>Labocheilus melanotaenla</i>	Pa Khang lai		Xe Bang Hiang	X				B51
Schilbeidae	<i>Laides hexaneme</i>	Pa kampheum		Phou xang	X				B 10
Bagridae	<i>Leiocassis siamensis</i>	Pa khi hia		Xe Bang Hiang, Houay Samphan	X				B51
Leuciscinae	<i>Luciocyprinus striolatus</i>	Pa Cher (k)		Dong Phou Vieng	X				B27
Cyprinidae	<i>Luciosoma sp .or spp</i>	Pa sieu houa gnen		Xe Bang Hiang	X				B51
Cyprinidae	<i>Macrochirichtys macrochirus</i>	Pa phak pha		Xe Bang Hiang	X				B51
Mastacembellidae	<i>Macrognathus siamensis or.spp</i>	Pa lat		Xe Bang Hieang, Xe Lanong, Houay Chaloi	X				B51
Mastacembellidae	<i>Mastacembelus cf. armatus</i>	Pa lat dam		Xe Bang Hieang, Xe Lanong, Houay Chaloi	X				B51
Cyprinidae	<i>Mekongna erythrospila</i>	Pa sa i		Xe Bang Hiang	X				B51
Siluridae	<i>Micronema apogon</i>	Pa Saguan (k)		Dong Phou Vieng; Xe Bang Hiang	X				B27; B51
Siluridae	<i>Micronema bleekeri</i>	Pa Khet (k)		Dong Phou Vieng	X				B27
Siluridae	<i>Micronema micronema</i>	Pa Nang (k)		Dong Phou Vieng	X				B27
Siluridae	<i>Micronema sp.or spp</i>	Pa nang		Xe Bang Hiang	X				B51
Synbranchidae	<i>Monopterus alvus</i>	Lan		Xe Bang Hieang, Xe Lanong, Houay Chaloi, Hou Palouang	X				B51
Tetraodontidae	<i>Monotreta bayley</i>	Pa pao thong		Xe Bang Hiang	X				B51
Tetraodontidae	<i>Monotreta leiurus</i>	Pa pao		Xe Bang Hiang	X				B51
Tetraodontidae	<i>Monotreta sp or spp</i>	Pa pao		Xe Bang Hiang	X				B51
Cyprinidae	<i>Morulius chyrsophekadion</i>	Pa phia		Xe Bang Hiang	X				B51
Cyprinidae	<i>Mystacoleus marginatus</i>	Pa lang ko		Xe Bang Hiang, Houay Samphan, Xe Lanong, Houay Chailoi	X				B51

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Bagridae	<i>Mystus bocourti</i>	Pa kha gneng ngao		Xe Bang Hiang		X			B51
Bagridae	<i>Mystus microphthalmus</i>	Pa kheung		Xe Bang Hiang, Houay Samphan, Xe Lanong, Houay Chailoi		X			B51
Bagridae	<i>Mystus nemurus</i>	Pa kot leuang		Xe Bang Hiang, Houay Samphan, Xe Lanong, Houay Chailoi		X			B51
Bagridae	<i>Mystus sp. Or spp</i>	Pa khagneng		Xe Bang Hiang		X			B51
Notopteridae	<i>Notopterus notopterus</i>	Pa tong		Xe Bang Hiang, Houay Samphan		X			B51
Siluridae	<i>Ompok bimauculatus</i>	Pa seuam		Phou xang; Xe Bang Hiang	X	X			B 10; B51
Siluridae	<i>Ompok hypophthalmus</i>	Pa Pikai (k)		Dong Phou Vieng		X			B27
Cyprinidae	<i>Opsarius pulchilus</i>	Pa Ka tep		Xe Bang Hiang, Houay Samphan, Xe Lanong, Houay Chailoi		X			B51
Channidae	<i>Osphronemus exodon</i>	Pa men		Xe Bang Hiang, Hou Palouang		X			B51
Cyprinidae	<i>Osteochilus hasselti</i>	Pa lai Kai/khu ka peu		Xe Bang Hiang, Houay Samphan, Xe Lanong, Houay Chailoi		X			B51
Cyprinidae	<i>Osteochilus melanopleurus</i>	Pa nok khao		Xe Bang Hiang		X			B51
Cyprinidae	<i>Osteochilus microcephalus</i>	Pa hang deng		Xe Bang Hiang		X			B51
Cyprinidae	<i>Osteochilus sp</i>			Xe Bang Hiang		X			B51
Eleotridae	<i>Oxyeleotris marmorata</i>	Pa bou		Xe Bang Hiang		X			B51
Pangasidae	<i>Pangalus larnaudiei</i>	Pa peuk		Xe Bang Hiang		X			B51
Pangasidae	<i>Pangasiandon hypophthalmus</i>	Pa souay kheo		Xe Bang Hiang		X			B51
Pangasidae	<i>Pangasius bocourti</i>	Pa yang		Xe Bang Hiang		X			B51
Pangasidae	<i>Pangasius conchophilus</i>	Pa hoi houa lem		Xe Bang Hiang		X			B51
Pangasidae	<i>Pangasius krempfi</i>	Pa souay hanc leuang		Xe Bang Hiang		X			B51
Pangasidae	<i>Pangasius macronema or. Spp</i>	Pa gnone		Xe Bang Hiang		X			B51
Pangasidae	<i>Pangasius pleurotactia</i>	Pa gnone thong khom		Xe Bang Hiang		X			B51
Pangasidae	<i>Pangasius sanitwongsel</i>	Pa leum		Xe Bang Hiang		X			B51
Cyprinidae	<i>Parachela sp. Or spp</i>	Pa tep ta leuang		Xe Bang Hiang		X			B51
Cyprinidae	<i>Paralaubuca typus or spp</i>	Pa tep		Xe Bang Hiang		X			B51
Ambassidae	<i>Parambassis sp.or spp</i>	Pa khap khong		Xe Bang Hiang		X			B51
Semiploti	<i>Poropuntius sp.</i>	Pa chaat		Phou xang	X				B 10
Cyprinidae	<i>Poropuntius deayratus or spp</i>	Pa chat		Xe Bang Hiang, Houay Samphan		X			B51
Nandidae	<i>Pristolepis fasciata</i>	Pa ka		Xe Bang Hiang		X			B51
Cyprinidae	<i>Probarbus jullieni</i>	Pa eun deng	E	Xe Bang Hiang		X			B51
Cyprinidae	<i>Probarbus labeamajor</i>	Pa eun khao		Xe Bang Hiang		X			B51
Cyprinidae	<i>Puntioptes falcifer</i>	Pa sakang		Xe Bang Hiang, Houay Samphan, Xe Lanong, Houay Chailoi		X			B51

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Cyprinidae	<i>Puntius brevis</i>	Pa sieu khao		Phou xang he; Xe Bang Hiang	X	X				B 10; B51
Cyprinidae	<i>Raiamas guttatus</i>	Pa Sanak		Xe Bang Hiang, Houay Samphan, Xe Lanong, Houay Chailoi		X				B51
Cyprinidae	<i>Rasbora aurotaenia</i>	Pa sieu ao		Xe Bang Hiang, Houay Samphan		X				B51
Cyprinidae	<i>Rasbora borapetensis</i>	Pa sieu		Xe Bang Hiang, Houay Samphan		X				B51
Cyprinidae	<i>Rasbora paviei</i>	Pa sieu ao		Xe Bang hiang, Houay Samphan, Xe Lanong		X				B51
Cyprinidae	<i>Rasbora trilineata</i>	Pa sieu ao		Xe Bang Hiang		X				B51
Gobidae	<i>Rhinogobius sp or spp</i>	Pa bou		Xe Bang Hiang		X				B51
Cyprinidae	<i>Scaphognathops bandanensis</i>	Pa pian		Xe Bang Hiang, Houay Samphan, Xe Lanong, Houay Chailoi		X				B51
Cyprinidae	<i>Scaphognathops stejnegeri</i>	Pa pian		Xe Bang Hiang, Houay Samphan, Xe Lanong, Houay Chailoi		X				B51
Balitoridae	<i>Schistura sp.Nemachellus sp. Or spp</i>	Pa hak kouay		Xe Bang Hiang		X				B51
Cyprinidae	<i>Sikukia gudgeri</i>	Pa mang		Xe Bang Hiang		X				B51
Systemi	<i>Systemus aurotaeniatus</i>	Pa khaw		Phou xang; Xe Bang Hiang	X					B 10
Cyprinidae	<i>Systemus binotatus</i>	Pa pok hang tem		Xe Bang Hiang, Houay Samphan		X				B51
Cyprinidae	<i>Systemus orphoides</i>	Pa pok		Xe Bang Hiang, Houay Samphan		X				B51
Cyprinidae	<i>Systemus partupentazona</i>	Pa seua noi		Xe Bang Hiang		X				B51
Clupeidae	<i>Tenualosa thibaudeaui</i>	Pakatep	E	Xe Bang Hiang		X				B51
Cyprinidae	<i>Thynnichtys thynnoides</i>	Pa ket lep		Xe Bang Hiang		X				B51
Tores	<i>Tor sp.</i>	Pa Goo Wark (k)		Dong Phou Vieng		X				B27
Tores	<i>Tor tambroides</i>	Pa Gro (k)		Dong Phou Vieng		X				B27
Toxidae	<i>Toxotes sp or spp</i>	Pa seua		Xe Bang Hiang		X				B51
Osphreomidae	<i>Trichiopsis Sp.ot spp</i>	Pa mat		Xe Bang Hiang		X				B51
Belontiidae	<i>Triechogaster trichopterus</i>	Pa kadeut		Xe Bang Hiang		X				B51
Siluridae	<i>Wallago attu</i>	Pa khao		Xe Bang Hiang, Houay Samphan		X				B51
Siluridae	<i>Wallago leeri</i>	Pa Koun (k)		Dong Phou Vieng		X				B27
Siluridae	<i>Wallago leeri</i>	Pa Khoun		Xe Bang Hiang, Houay Samphan		X				B51
Belonidae	<i>Xenentodon cancila</i>	Pa kathong		Xe Bang Hieang, Xe Lanong, Houay Chaloi		X				B51

Annex 4.1: Plant Species

Family Name	Scientific Name	Lao Name	Conservation Status - IUCN Redlist	USE	Savanna khet			Salavan		Source
					PX H	DP V	No n-PA	X S	Non-PA	
Rhamnaceae	-	Nam lep meo		Edible fruit			x			B14
Malvaceae	<i>Abelmoschus moschatus Medicus</i>	Ta ven paa		Medicinal plant			x			B14
Papilionoideae	<i>Abrus punchellum Wall, ex Thw</i>	Kham kua		Medicinal Plant			x			B14
Mimosoideae	<i>Acacia concinna (Willd.) A.DC</i>	Sompoy		Medicinal Plant, and the fruit can			x			B14
Mimosoideae	<i>Acacia farnesiana (Linn.) Willd</i>	Kham thed		The young leaves can be eaten raw or cooked			x			B14
Mimosoideae	<i>Acacia magalagena Desv.</i>	Nam han		Poisonou plant			x			B14
Leguminosae	<i>Acacia pennata</i>	Phak Nao		Food	x					B27
Amaranthaceae	<i>Achyranthes bedentata BL.</i>	Nhakhouyngu		Medicinal plant			x			B14
Araceae	<i>Acorus tatrnowi Schott.</i>	Phak paen nam		Medicinal plant			x			B14
Pteridoideae	<i>Acrostictium aureum L.</i>	-		Decorative fern			x			B14
Papilionoideae	<i>Adenanther pavonina L.</i>	Sathon		stem used for firewood and fence making			x			B14
Papilionoideae	<i>Adenantha parvonina var. microsperma</i>	Lurn ta kai		stem used for firewood and fence making			x			B14
Adiantaceae	<i>Adiantum caudatum L.</i>	Phak kud		Decorative fern			x			B14
Amaranthaceae	<i>Ae vera sanguinolenta (L.) BL.</i>	Sanhakhouyng ou		Medicinal plant			x			B14
Leguminosae	<i>Azelia xylocarpa</i>	Mai Thae kha		Building materials	x					B27
Caesalpinioideae	<i>Azelia xylocarpa (Kurz) Craib</i>	Mai tae kha	En A1cd	Good timber			x			B14
Asteraceae	<i>Ageratum conyzoides DC.</i>	Nha Kheo		Medicinal plant			x			B14
Araceae	<i>Aglonema costatum N.E..Brown.</i>	-		Medicinal plant			x			B14
Simaroubaceae	<i>Ailanthus malabarica DC.</i>	Nhom pa		stem used for firewood making			x			B14
Alangiaceae	<i>Alangium chinense Rehd.</i>	Khao yen		stem used for firewood and fence			x			B14

				making						
Alangiaceae	<i>Alangium kurzii</i> Craib	Ton sa lik		stem used for firewood and fence making			x			B14
Mimosoideae	<i>Albizia chinensis</i> (Osb.) Merr.	Mai Kang hung		stem used for firewood and fence making			x			B14
Liliceae	<i>Allium cepa</i> L.	Phak bua		Edible leaves. Medicinal plant			x			B14
Liliceae	<i>Allium sativum</i> L.	Phak thiem		Edible leaves. Medicinal plant			x			B14
Araceae	<i>Alocasia longifolia</i> Miq.	Bon dong		Decorative plant			x			B14
Araceae	<i>Alocasia macrorrhiza</i> (L.) D.Don.	Ka bouk		-			x			B14
Zingiberaceae	<i>Alpinia purpulata</i> (Veiell.) K. Schum	Kha		Edible tube			x			B14
Zingiberaceae	<i>Alpinia</i> spp.	Kha paa		Food		x				B27
Apocynaceae	<i>Alstonia scholaris</i> (L.) R.Br	Mai tin ped		Timber			x			B14
Amaranthaceae	<i>Alternanthera sessilis</i>	Nha khau mai		Edible young shoot			x			B14
Malvaceae	<i>Althaea rosea</i> (L.) Cav.	Dok chad		Decorative plant			x			B14
Amaranthaceae	<i>Amaranthus gracilis</i> Desf.	Phak home		Edible young shoot			x			B14
Amaranthaceae	<i>Amaranthus spinosus</i> Linn	Phak home nam		Edible young shoot			x			B14
Amaranthaceae	<i>Amaranthus viridis</i> L.	Phak home ban		Edible young shoot			x			B14
Sapindaceae	<i>Amesiodendron chinense</i> (Merr.) Hu.	Ko ka	NT	Timber			x			B14
Commelinaceae	<i>Amiscolotype hispida</i> (Less. & Rich) Hong	Nha kap dong		Decorative plant			x			B14
Zingiberaceae	<i>Amomum ovoidum</i> Pierre. Ex Gagn.	Mak naeng		Medicinal plant			x			B14
Zingiberaceae	<i>Amomum ovoidum</i> / <i>Amomum</i> spp.	Mak Neng		Income & exchange	x					B27
Zingiberaceae	<i>Amomum</i> spp.	Nor Phain Din		Food	x					B27
Vitaceae	<i>Ampelocissus martinii</i>	Mak Lang Duak		Food		x				B27
Vitaceae	<i>Ampelopsis cantoniensis</i> (H.&A.)L.	-		Medicinal plant			x			B14
Anacardiaceae	<i>Anacardium occidentale</i> L.	Muang hi ma fan		Edible fruit and seed, stem used for firewood making			x			B14
Bromeliaceae	<i>Ananas comosus</i> (L.) Merr.	Mak nad		Edible ripe fruit			x			B14
Ancistrocladaceae	<i>Ancistrocladus tectorius</i>	Khu hang kouy		Medicinal plant and edible young leaves	x		x			B14; B27
Angiopteridaceae	<i>Angiopteris evecta</i> (Forst.) Hoff	Kud ka dong		Decorative fern			x			B14

e									
Dipterocarpaceae	<i>Anisoptera costata</i> Korth	Mai bak	E	Good timber			x		B14
Combretaceae	<i>Anogeinsus acuminata</i> Wall	Ben mon		Timber and stem used for firedwood making			x		B14
Annonaceae	<i>Anomiamthus dulcis</i>	Brian Gra Young		Food		x			B27
Meliaceae	<i>Aphanomixis polystachya</i> J.N. Parker	Ta xua		Timber and stem used for firedwood making			x		B14
Poaceae	<i>Apluda mutica</i> L.	Oi nu		Medicinal plant			x		B14
Euphorbiaceae	<i>Aporasa ficifolia</i> H. Baillon	Muad khon		Stem used for firedwood making			x		B14
Euphorbiaceae	<i>Aporasa macrostachyus</i> (Tul.)Muell-Arg	Muad khon		Stem used for firedwood making			x		B14
Euphorbiaceae	<i>Aporasa villosa</i> (Lindl.)H. Baill	Mai muad		Stem used for firedwood making			x		B14
Araliaceae	<i>Aralia armata</i> Seem	Ton tang		Decorative plant, Young shoot can be eaten cooked			x		B14
Araliaceae	<i>Aralia foliosa</i> Wall. & Clarke	Tang noi		Decorative plant, Young shoot can be eaten cooked			x		B14
Mimosoideae	<i>Archidendron clyperia</i> (Jack.) Niels	Ben bai		Medicinal plant			x		B14
Mimosoideae	<i>Archidendron robinsonii</i> (Gagn.) Niels	Mai ba lee		Timber, and srem can be used for house biulding and firewood making			x		B14
Myrsinaceae	<i>Ardisia crenata</i> Sims	Tin cham		Decorative plant, and ripe fruit can be eaten			x		B14
Euphorbiaceae	<i>Ardisia mamillata</i> Hance.	Tin cham		Decorative plant, and ripe fruit can be eaten			x		B14
Myrsinaceae	<i>Ardisia villosa</i> Roxb.	Tin cham khon		Decorative plant, and ripe fruit can be eaten			x		B14
Myrsinaceae	<i>Ardisia virens</i> Kurz.	Tin cham		Decorative plant, and ripe fruit can be eaten			x		B14
Palmae	<i>Arenga pinnata</i> (Wurmb.) Merr.	Ton tan		Young shoot can be eaten cooked, Decorative plant			x		B14
Convolvulaceae	<i>Argyreia capitata</i> Choisy	-		Decorative plant			x		B14
Convolvulaceae	<i>Argyreia roxburghii</i> Craib	-		Decorative plant			x		B14
Asteraceae	<i>Artemisia vulgaris</i> L	Nad		Medicinal plant			x		B14
Moraceae	<i>Artocarpus chaplasha</i> Roxb.	kha noun, me		Good timber			x		B14

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		pa							
Moraceae	<i>Artocarpus heterophylla Lamk.</i>	Ton mi		Good timber, Edible friute			x		B14
Moraceae	<i>Artocarpus lokocha Roxb</i>	Ton had		Good timber			x		B14
Poaceae	<i>Arundinaria ciliata A.cammus.</i>	Mai chot		Young shoot can be eaten cooked			x		B14
Aspleniaceae	<i>Asplenium nidus L.</i>	Phak kud		Decorative fern			x		B14
Athyriaceae	<i>Athyrium esculentum (Retz) Copel</i>	Phak kud khao		Young shoot can be eaten raw or cooked			x		B14
Fungi	<i>Auricularia spp.</i>	Het Kadang		Food		x			B27
Meliaceae	<i>Azadirachta indica</i>	Phak Gadao		Food	x				B27
Euphorbiaceae	<i>Bacaurea ramiflora Lour.</i>	Mak fai		Edible fruit. Stem can be used for firewood and fence making			x		B14
Poaceae	<i>Bambusa arundinacea Willd.</i>	Mai phai pa		Young shoot can be eaten cooked. Stem used for house building and fence making		x	x		B14; B27
Poaceae	<i>Bambusa flexuosa</i>	Mai Ga Sa		Building materials		x			B27
Poaceae	<i>Bambusa spinosa</i>	Nor Mai		Food	x				B27
Poaceae	<i>Bambusa spp.</i>	Mai Go		Building materials		x			B27
Poaceae	<i>Bambusa spp.</i>	Bai Mai Phai		Fodder & Grazing	x				B27
Poaceae	<i>Bambusa spp.</i>	Bai Mai Phai Ban		Fodder & Grazing	x				B27
Poaceae	<i>Bambusa spp.</i>	Mai Phai		Building materials	x				B27
Poaceae	<i>Bambusa tulda Roxb.</i>	Mai bong		Young shoot can be eaten cooked. Stem used for house building and fence making			x		B14
Poaceae	<i>Bambusa spp.</i>	Mai Por		Fodder & Grazing		x			B27
Poaceae	<i>Bambusa vulgaris</i>	Mai Saeng Kham		Fodder & Grazing		x			B27
Acanthaceae	<i>Barleria strigosa Willd</i>	-					x		B14
Lecythidaceae	<i>Barringtonia macrostachya (Jack) Kurz</i>	Nom nhan		Stem can be used for firewood and fence making			x		B14
Caesalpinioideae	<i>Bauhinia variegata L.</i>	Ton sieu		Stem can be used for firewood and fence making. The flowers can be eaten cooked			x		B14
Leguminosae	<i>Bauhinia saccocalyx</i>	Kheua Somphan		Building materials		x			B27
Caesalpinioideae	<i>Bauhinia saccocalyx Pierre</i>	Po sean phan		The bark can be used for string making			x		B14
Caesalpinioideae	<i>Bauhinia sp.</i>	Sieu Khua		Decorative plant			x		B14

Cucurbitaceae	<i>Benincasia hispida</i> (Thunb.) Cogn.	Mak nam		the fruit can be eaten cooked			x			B14
Asteraceae	<i>Bidens bipinnata</i> L.	Nha kon cham		Medicinal plant			x			B14
Euphorbiaceae	<i>Bischofia javanica</i> BL.	Khom fad		Goodtimber, young leaves and fruit can be eaten raw			x			B14
Blechnaceae	<i>Blenchunum orientale</i> L.	Koud kan deng		Decorative fern			x			B14
Asteraceae	<i>Blumea balsamifera</i> (L.) DC	Nad		Medicinal plant			x			B14
Bombacaceae	<i>Bombax ceiba</i> L.	Ngieu dok deng		Timber, and Decorative plant			x			B14
Bombacaceae	<i>Bombax insigis</i> Wall	Ngieu dok deng		Timber, and Decorative plant			x			B14
Anacardaceae	<i>Bouea burmanica</i>	Mak Bang		Food		x				B27
Euphorbiaceae	<i>Bouea oppositifolia</i>	Mak Phang		Food		x				B27
Nyctaginaceae	<i>Bougainvillea spectabilis</i> Willd.	Ton dok chia					x			B14
Brassicaceae	<i>Brassica intergrifolia</i> (Weat.) O.B.Schultz	Phak kad		Edible leaves			x			B14
Euphorbiaceae	<i>Breynia fruticosa</i> (L.) Hook.f	kok kang pa		Medicine Plant			x			B14
Moraceae	<i>Broussonetia papyrifera</i> (L.) L'Her.ex Vent	Po sa		Fiber bark. The stem used for firewood making			x			B14
Anacardaceae	<i>Buchanania obtusifolia</i>	Mak Laboota		Food		x				B27
Buddlejaceae	<i>Buddleja asiatica</i> Lour	Ngua sang		Medicine Plant			x			B14
Sterculiaceae	<i>Byttneria aspera</i> Colebr	-		Medicine Plant			x			B14
Caesalpinioideae	<i>Caesalpinia digyna</i> Rottl. & Willd	Nam ka chai		Medicinal plant			x			B14
Caesalpinioideae	<i>Caesalpinia mimosoides</i> Lamk	Nam pu ya		Medicinal plant and eatable young shoot			x			B14
Palmae	<i>Calamus gracilis</i>	Vai Khome		Tools & Handicrafts	x					B27
Palmae	<i>Calamus javensis</i> Ridly.	Wai hang nu		-			x			B14
Palmae	<i>Calamus rudentum</i>	Vai yoon		Food	x					B27
Palmae	<i>Calamus sp.</i>	Wai ta bong		Young shoot can be eaten raw or cooked. Stem used for furniture making	x		x			B14; B27
Palmae	<i>Calamus viminalis</i> Willd.	Wai khom		Young shoot can be eaten raw or cooked. Stem used for furniture making			x			B14
Verbenaceae	<i>Callicarpa arborea</i> Roxb	Mai ko faa		Timber			x			B14
Verbenaceae	<i>Callicarpa longifolia</i> Lam	Sa ko faa		Decorative plant			x			B14
Guttiferae	<i>Calophyllum polyanthum</i> Wall. Ex Choisy	Mai song		Timber			x			B14

Combretaceae	<i>Calycopteris floribunda (Roxb) Lamk</i>	Khua ka daeng		Medicinal plant			x			B14
Burseraceae	<i>Canarium kerrii Craib</i>	Mak kok luam		Stem can be use for firewood making			x			B14
Papilionoideae	<i>Canavalia rosea</i>	Khua fak faa		Decorative plant			x			B14
Rubiaceae	<i>Canthium dicoceum Gaerth var, rostratum</i>	Kheung paa		stem use for firewood, and the fruit can be eaten cooked			x			B14
Rubiaceae	<i>Canthium horridum BL</i>	Mak kheung paa		stem use for firewood, and the fruit can be eaten cooked			x			B14
Capparaceae	<i>Capparis acutifolia subsp, sabiaefolia (Hook.f. & TH/) Jac</i>	Sa ton sa sou		Decorative plant			x			B14
Capparaceae	<i>Capparis micrantha DC</i>	Ton sa sou		Decorative plant			x			B14
Solanaceae	<i>Capsicum frutescens L.</i>	Mak phet		Edible fruit and young leaves			x			B14
Sapindaceae	<i>Cardiospermum halicacabum L.</i>	Sai num		Decorative plant			x			B14
Lecythidaceae	<i>Careya shpaerica</i>	Phak Gadone		Food		x				B27
Lecythidaceae	<i>Careya sphaerica Roxb.</i>	Ka don		Timber, and young leaves can be eaten raw			x			B14
Caricaceae	<i>Carica papaya L.</i>	Mak hung		Young fruit and flower can be eaten cooked, and the ripe fruit can be eaten raw			x			B14
Palmae	<i>Caryota mitis Lour.</i>	Tau hang noi		Decorative plant			x			B14
Palmae	<i>Caryota monostachya Becc.</i>	Tau hang noi		Decorative plant			x			B14
Flacourtiaceae	<i>Casearia grewiaefolia Vent var grewiaefolia</i>	Mai ka douk		Stem used for firewood and fence making			x			B14
Caesalpinioideae	<i>Cassia acidenialis L</i>	Nha lup meun		Medicinal plant			x			B14
Caesalpinioideae	<i>Cassia alata L.</i>	Khee lek ban		Medicinal plant			x			B14
Caesalpinioideae	<i>Cassia fistula L</i>	Ton dok khoun		Stem used for firewood, decorative plant			x			B14
Caesalpinioideae	<i>Cassia timoriensis A. DC</i>	Ton ka la pheuk		Stem used for firewood, decorative plant			x			B14
Caesalpinioideae	<i>Cassia tora L</i>	Nha lup meun		Medicinal plant			x			B14
Zingiberaceae	<i>Catimbium bracteatum Roxb.</i>	Man kha		Edible young shoot			x			B14
Amaranthaceae	<i>Celosia argentea L</i>	Dok hon kai		Decorative plant			x			B14

Ulmeceae	<i>Celtis tetrandra Roxb</i>	Mai Kieu		Stem used for firewood and fence making			x			B14
Apiaceae = Umbelliferae	<i>Centella asiatica (L.) Urb</i>	Phak nok		Medicinal plant and edible leaves			x			B14
Poaceae	<i>Cephalostachyum pergracile Murro.</i>	Mai phang		Young shoot can be eaten cooked. Stem used for house building and fence making			x			B14
Asteraceae	<i>Chromatolaena odorata (Linn) King et Robins</i>	Nha pheun		Medicinal plant			x			B14
Sapotaceae	<i>Chrysophyllum cainito L</i>	Ton nam nom		Edible fruit			x			B14
Poaceae	<i>Chrysopogon aciculatus (Retz.) Trin.</i>	Nha khuak		Medicinal plant			x			B14
Lauraceae	<i>Cinnamomum cambodiamum H. Lee</i>	Sa chuang		Medicinal plant and stem used for firewood and fence making			x			B14
Lauraceae	<i>Cinnamomum iners Reinw</i>	Sa chuang		Medicinal plant and stem used for firewood and fence making			x			B14
Vitaceae	<i>Cissus evrardil Gagn.</i>	Khua som koi		Edible young shoot			x			B14
Vitaceae	<i>Cissus hastata PL</i>	Khua houn		Medicinal plant			x			B14
Vitaceae	<i>Cissus javana DC.</i>	Khua poun		Medicinal plant			x			B14
Rutaceae	<i>Citrus grandis (L.) Osb</i>	Mak phouk		Edible ripe fruit			x			B14
Rutaceae	<i>Citrus limon (L) Burm. F</i>	Mak nao		Edible ripe fruit			x			B14
Rutaceae	<i>Clausena excavata Burm. F</i>	Song faa		Medicinal plant			x			B14
Capparaceae	<i>Cleome gynandra L</i>	Sa phak sien		Medicinal plant			x			B14
Verbenaceae	<i>Clerodendrum celebrikanum Walp.</i>	Phoung phing khao		Decorative plant			x			B14
Verbenaceae	<i>Clerodendrum schmidtii C.B.CL</i>	Phoung phing		Decorative plant			x			B14
Verbenaceae	<i>Clerodendrum serratum (L) Moon</i>	Phoung phing		Decorative plant			x			B14
Verbenaceae	<i>Clerodendrum spp.</i>	Kham Pi Dong		Medicine	x					B27
Palmae	<i>Cocos nucifera L.</i>	Mak phao		Edible fruit			x			B14
Araceae	<i>Colocasia esculenia (L.) Schott.</i>	Bon		Young can be eaten cooked			x			B14
Araceae	<i>Colocasia flavescents</i>	Born		Food	x					B27
Asclepiadaceae	<i>Colotropis gigantea (L) Dryand</i>	Ton dok hak		Decorative plant			x			B14
Combretaceae	<i>Combretum pilosum Roxb</i>	Khua kae		Decorative plant			x			B14
Connaraceae	<i>Connarus cochinchinensis Pierre</i>	Houn hai		Medicinal plant			x			B14
Asteraceae	<i>Conyza sumatrensis (Retz)</i>	Nha fa lung		Medicinal plant			x			B14

	<i>Walker</i>									
Boraginaceae	<i>Cordia obliqua</i>	Manh Kho		Food		x				B27
Zingiberaceae	<i>Costus speculosus (Koenig.) Smith</i>	Kok uang		Medicinal plant			x			B14
Asteraceae	<i>Crassocephallum crepidioides (Benth) Moore</i>	Nha la mung		Edible young leaves			x			B14
Capparaceae	<i>Crateva nurvala Buch Ham</i>	Ton kum		Young can be eaten cooked. Stem used for firewood, soil erosion resistance			x			B14
Hypericaceae	<i>Cratoxylon formosum (Jack) Dyer</i>	Tieu som		Edible leaves and stem used for house building			x			B14
Hypericaceae	<i>Cratoxylon formosum subsp. Pruniflorum</i>	Tieu deng		Timber, and stem used for housing building			x			B14
Papilionoideae	<i>Crotalaria assamica Benth</i>	Mak hing man		Decorative plant			x			B14
Papilionoideae	<i>Crotalaria incana L.</i>	Mak hing		Decorative plant			x			B14
Papilionoideae	<i>Crotalaria verrucosa L.</i>	Mak hing man		Decorative plant			x			B14
Euphorbiaceae	<i>Croton abiongifolius Roxb</i>	Pao nhai		Stem used for firewood			x			B14
Euphorbiaceae	<i>Croton konggensis Gagn</i>	Pao thong		Medicinal plant			x			B14
Crypteroniaceae	<i>Crypteronia paniculata BL</i>	Mai sa am		Timber			x			B14
Araceae	<i>Cryptocoryne crispatula Engler</i>	-		Decorative plant			x			B14
	<i>Cryptophragmium signatum</i>	Dong Hong		Income & exchange	x					B27
Zingiberaceae	<i>Cucuma domestica</i>	Waan		Medicinal plant			x			B14
Cucurbitaceae	<i>Cucurbita maxima Duch ex. Dam</i>	Mak euk		Edible fruit			x			B14
Moraceae	<i>Cudrania tricuspidata (Carr. Bur. Ex Lavel)</i>	Nam thaeng		Fruit eaten by animal			x			B14
Amaryllidaceae	<i>Curculigo latifolia Dryand. Ex Ait.</i>	Thien phi		Decorative plant			x			B14
Zingiberaceae	<i>Curcuma alisamatifolia or Curcuma Thoreli</i>	Phak Warn		Food	x					B27
Cuscutaceae	<i>Cuscuta chinensis Lam</i>	Khua kham		Young shoot can be eaten cooked			x			B14
commelinaceae	<i>Cyanotis arachnoidea C.B.CL</i>	-		Decorative plant			x			B14
Cyatheaceae	<i>Cyathea gigantea (Hook.) Holtt.</i>	Kud ton		Decorative fern			x			B14
Amarabthaceae	<i>Cyathula prostrata (L.) BL</i>	Sa khouay ngu		Medicinal plant			x			B14
Cycadaceae	<i>Cycas revoluta Thunb</i>	Pong. Hua nom knaa		Decorative plant			x			B14
Menispermaceae	<i>Cyclea barbata Miers</i>	Khua mo noi		Medicinal plant			x			B14

Menispermaceae	<i>Cyclea hypoglauca (Schauer) Diels</i>	-		Medicinal plant			x			B14
Orchidaceae	<i>cymbidium dayanum Reichh.F</i>	-		Decorative plant			x			B14
Poaceae	<i>Cynodon doctylon (L.) Pers</i>	Nha faed		Medicinal plant			x			B14
Cyperaceae	<i>Cyperus rotundus L</i>	Nha heo mu		Medicinal plant			x			B14
Araceae	<i>Cyrtosperma merkusil (Hassk) Schott.</i>	Phak nam		Young shoot can be eaten cooked			x			B14
Palmae	<i>Dalbergia schmidtiana Palmae</i>	Boun			x	x				B27
Leguminosae	<i>Dalbergia spp./Dialium spp.</i>	Mai Yoon		Building materials	x					B27
Solanaceae	<i>Datula metal L</i>	Khua ba		Decorative plant			x			B14
Poaceae	<i>Dcephalostachyum virgatum Kurz.</i>	Mai hia		Young shoot can be eaten cooked. Stem used for house building and fence making			x			B14
Podocarpaceae	<i>Decusocarpus wallichianus (Presi) de Laubenf.</i>	Ter choi		Timber, firewood making			x			B14
Caesalpinioideae	<i>Delomix regia (Hook) Raf</i>	Ton fang daeng		Decorative plant			x			B14
Orchidaceae	<i>Dendrobium sp</i>	Kouay mai		Young shoot can be eaten cooked			x			B14
Poaceae	<i>Dendrocalamus longifimbritus Gamble</i>	Mai phoung		Young shoot can be eaten cooked. Stem used for house building and fence making			x			B14
Papilionoideae	<i>Derris sp.</i>	Khua khau pok					x			B14
Papilionoideae	<i>Desmodium triquetrum (L) DC</i>	-		Medicinal plant			x			B14
Caesalpinioideae	<i>Dialium cochinchinensis Pierre</i>	Mak kham faed		Edible ripe fruit and stem used for firewood and fence making			x			B14
Gleichenuaceae	<i>Dicranopteris linearis (Burm.) Undrew.</i>	Kud khua		Decorative fern			x			B14
Dilleniaceae	<i>Dillenia baillonia</i>	San faeng		Timber and stem used for firewood making			x			B14
Dilleniaceae	<i>Dillenia Indica L.</i>	San kin		Edible fruit			x			B14
Dilleniaceae	<i>Dillenia kerii Craib</i>	San kheng		Edible fruit			x			B14
Dilleniaceae	<i>Dillenia obobata (BL) Hoogland</i>	San nhai		Timber			x			B14
Dilleniaceae	<i>Dillenia parviflora</i>	Mak San		Food	x					B27

Poaceae	<i>Dinochloa mascllellandii</i> Kurz.	Mai hae		Young shoot can be eaten cooked. Stem used for house building and fence making.			x			B14
Dioscoreaceae	<i>Dioscorea bulbifera</i> L,	Man pau		Decorative			x			B14
Dioscoreaceae	<i>Dioscorea clrrhosa</i> Priain & Burk.	Khua man		Decorative			x			B14
Dioscoreaceae	<i>Dioscorea glabra</i> Roxb	Khua man		Medicinal plant			x			B14
Discoriaceae	<i>Dioscorea</i> spp.	Manh Paa		Food			x			B27
Dioscoreaceae	<i>Dioscorea triphylla</i> L.	Koi		#N/A			x			B14
Ebunaceae	<i>Diospiros filipendula</i>	Kok Kanthong		Food			x			B27
Ebenaceae	<i>Diospiros</i> spp.	Gam Lang Moo Kaoh		Medicine		x				B27
Ebenaceae	<i>Diospyros chretioides</i> Wall. Ex G. Don	Huang kouang		Stem used for firewood and fence making			x			B14
Ebenaceae	<i>Diospyros kaki</i> L.F	Mak ko		Edible ripe fruit, and stem used for firewood and fence making			x			B14
Ebenaceae	<i>Diospyros phillippensis</i> (Desr) Gurke	Mon khai		Edible ripe fruit, and stem used for firewood and fence making			x			B14
Ebenaceae	<i>Diospyros</i> sp.	Mai nang dam		Edible ripe fruit, and stem used for firewood and fence making			x			B14
Melastomataceae	<i>Diplectria barabata</i> (C.B.CL.) Frank & Roos	En a		Decorative plant			x			B14
Dipterocarpaceae	<i>Dipterocarpus alatus</i>	Nam Mun yang		Income & exchange		x				B27
Dipterocarpaceae	<i>Dipterocarpus costatus</i> Gaertn	Mai nhang dong		Good timber			x	x		B14; B27
Dipterocarpaceae	<i>Dipterocarpus grandifolrus</i> BLCO	Nhang dong kiang		Good timber			x			B14
Dipterocarpaceae	<i>Dipterocarpus obtusifolius</i> teysm	Mai sad		Good timber			x			B14
Dipterocarpaceae	<i>Dipterocarpus tuberculatus</i>	Mai Goung		Building materials			x			B27
Asclepiadaceae	<i>Dischidia balansae</i>	Sarra Ring (k)		Medicine			x			B27
Asclepiadaceae	<i>Dischidia nummularia</i> R.Br.	Ka doum noi		Decorative plant			x			B14
Asclepiadaceae	<i>Dischidia umbricata</i> (BL) Done	Khua ka doum		Decorative plant			x			B14
Bignoniaceae	<i>Dolichandrone spilata</i>	Khae puk na		Stem used for firewood			x			B14

Agavaceae	<i>Dracaena angustifolia</i>	Khon kaen		Young shoot can be eaten cooked, Medicinal plant	x		x			B14; B27
Polypodiaceae	<i>Drynaria quereifolia (L.) J. Smith</i>	Kud hua ka hok		Decorative fern			x			B14
Sonneratiaceae	<i>Duabanga grandiflora (DC) Walp</i>	Lin ngo		Tinber			x			B14
Papilionoideae	<i>Dunbaria longeracemosa Craib</i>	-		Medicinal plant			x			B14
Meliaceae	<i>Dysaxylum binectariferium Hook.f</i>	Ta suu		Stem used for firewood making			x			B14
Elaeagnaceae	<i>Elaeagnus conferta</i>	Mak Lord		Food		x				B27
Elaeocarpaceae	<i>Elaeocarpus floribundus BL</i>	Khai noun		Can be planted along the river bank for soil protection			x			B14
Elaeocarpaceae	<i>Elaeocarpus siamensis</i>	Som moun		Stem used for firewood making and fence making			x			B14
Elaeocarpaceae	<i>Elaeocarpus sp.</i>	-		Timber			x			B14
Urticaceae	<i>Elatostema acuminata (Poir) Brongn</i>	-		-			x			B14
Urticaceae	<i>Elatostema cuneatum Wight</i>	-		Medicinal plant			x			B14
Asteraceae	<i>Elephantopus scaber L</i>	Fai nok khum		Medicinal plant			x			B14
Poaceae	<i>Eleusine indica (L.) Gaertn</i>	Nha fak khouay		Edible young shoot			x			B14
Euphorbiaceae	<i>Endospermum chinense Benth</i>	Mai mak ouk		Timber			x			B14
Juglandaceae	<i>Engelhardia spicata Lesch. & BL.</i>	Mai phao		Stem used for house building			x			B14
Mimosoideae	<i>Entada glandulosa Pierre.ex Gagn</i>	Mak lae noi		The seed can be eaten cooked			x			B14
Mimosoideae	<i>Entada phaseoloides (L.) Merr.</i>	Mak lae		The seed can be eaten cooked			x			B14
Araceae	<i>Epipremnum giganteum Schott,</i>	Khua mum		Decorative plant			x			B14
Equisetaceae	<i>Equisetum diffusum D.Don</i>	Gna thod pong		Decorative fern			x			B14
Eriocauraceae	<i>Eriocaulon hayatanum Koyama.</i>	Nha hua ngok		Decorative plant			x			B14
Apiceae	<i>Eryngium foetidum L.</i>	Home pe		Edible leaves			x			B14
Caesalpinioiseae	<i>Erythrophleum fordii Oliv.</i>	Mai ka cha	E	Good timber, and stem can be use for house building, charcol			x			B14
Myrtaceae	<i>Eucalyptus sp.</i>	Ton vik		medicinal plant, and stem used for firewood and fence making			x			B14
Rutaceae	<i>Euodia leptta (Spreng.) Merr.</i>	Dee khon		Medicinal plant			x			B14
Euphorbiaceae	<i>Euphorbia antiquorum L.</i>	Chan dai		Decorative			x			B14
Euphorbiaceae	<i>Euphorbia cyanthophora Murr</i>	-		Decorative plant			x			B14
Euphorbiaceae	<i>Euphorbia hirta L.</i>	Nhang uang		Medicinal plant			x			B14

Simaroubaceae	<i>Eurycoma longifolia</i> Jack.	Nhik bo tong		Medicinal plant			x			B14
Papilionoideae	<i>Eythrina stricta</i> Roxb.	Ton thong		Decorative plant, and edibl young leaves			x			B14
Loganiaceae	<i>Fagraea fragrans</i> Roxb.	Ton man pa		Good timber			x			B14
Bignoniaceae	<i>Fernandoa adenophyllum</i> (D.Don.) steen	Khae khon		Stem used for firewood making			x			B14
Moraceae	<i>Ficus altissima</i> BL.	Hai deng		Fruit eaten by animals, birds			x			B14
Moraceae	<i>Ficus benjamina</i> var. <i>nada</i> (Miq.) Barret	Hai bai noi		Fruit eaten by animals, birds			x			B14
Moraceae	<i>Ficus callophylla</i> BL. Var. <i>callophylla</i>	Hai yon		Fruit eaten by animals, birds			x			B14
Moraceae	<i>Ficus fulva</i> Reinw. & BL.	Ton ham hok		Fruit eaten by animals, birds			x			B14
Moraceae	<i>Ficus heterophylla</i> L.F var. <i>heterophylla</i>	Nod nam		Fruit eaten by animals, birds			x			B14
Moraceae	<i>Ficus hirta</i> var. <i>roburghii</i> (Miq.) King	Hai khon		Fruit eaten by animals, birds			x			B14
Moraceae	<i>Ficus hispida</i> L.f. var. <i>hispida</i>	Mak dua pong		Edible fruit			x			B14
Moraceae	<i>Ficus ichnopoda</i> Miq.	Ton nom ma		Edible fruit			x			B14
Moraceae	<i>Ficus Pandurata</i> Hance	Dua paa		Edible eaten by birds			x			B14
Moraceae	<i>Ficus semicordata</i> Buch. - Ham.ex J.E.Sm.	Mak nod ton		Ripe fruit can be eaten raw			x			B14
Moraceae	<i>Ficus septica</i> Burn.f.var. <i>septica</i>	Mak dua pong		Fruit eaten by birds, fish			x			B14
Moraceae	<i>Ficus variegata</i> BL. Var. <i>varlegata</i>	Mak dua nam		Fruit eaten by birds, fish			x			B14
Leguminosae	<i>Flamingia chappa</i>	A yerng Rarm / A Young Rean (k)		Medicine		x				B27
Guttiferae	<i>Garcinia gracilis</i> Pierre.	Mak pern		Edible fruit			x			B14
Guttiferae	<i>Garcinia oliveri</i> Pierre.	Som mong		Edible fruit			x			B14
Guttiferae	<i>Garcinia</i> sp.	Mai nga loi		Stem used for firewood, fence making			x			B14
Guttiferae	<i>Garcinia tinctoria</i> (DC) Wight.	Som pong		Stem used for firewood, fence making			x			B14
	<i>Gardenia obtusifolia</i>	Mak Sida Paa				x				B27
Rubiaceae	<i>Gardenia Ph</i>	Khai nau		Stem used for firewood, fence making			x			B14
Rubiaceae	<i>Gardenia sootepensis</i> Hutch.	Sida khok		Stem used for firewood, fence making			x			B14
Rubiaceae	<i>Gardenia</i> spp.	Dok Koi Dan		Income & exchange	x					B27
Poaceae	<i>Gigantochloa albocillata</i>	Bai Mai Lai		Fodder & Grazing	x					B27
Zingiberaceae	<i>Globba</i> sp,	Waan fai		Medicinal plant			x			B14
Euphorbiaceae	<i>Glochidion eriocarpum</i> Champ.	Ton khee mod		Stem used for firewood, fence making			x			B14

Euphorbiaceae	<i>Glochidion lanceolarium (Roxb.) Voigt.</i>	Sa khee mod		Stem used for firewood, fence making			x			B14
Anacardiaceae	<i>Gluta megalocarpa (Evt.) Tard</i>	Mai nam kieng		-			x			B14
Rutaceae	<i>Glycosmis citrifolia (Willd.) Lindl.</i>	Som sun		Stem used for firewood, fence making			x			B14
Verbenaceae	<i>Gmelina arborea Roxb.</i>	Mai so		Good timber			x			B14
Gnetaceae	<i>Gnetum montanum Margf</i>	Khua mua		The fruit can be eaten cooked			x			B14
Icacinaceae	<i>Gonocaryum lobbianum (Mierr.)Kurz.</i>	Sieng muang		-			x			B14
Malvaceae	<i>Gossypium herbaceum L.</i>	Fai		Fiber			x			B14
Tiliaceae	<i>Grewia paniculata Roxb.ex DC</i>	Khom som		Stem used for firewood, Ripe fruit can be eaten			x			B14
Simarubaceae	<i>Harrisonia perfolata (BL.) Merr.</i>	Kon tha		Medicinal plant			x			B14
Rubiaceae	<i>Hedyotis auricularia L.</i>	Nha chi lo		Medicinal plant			x			B14
Rubiaceae	<i>Hedyotis capitellata Wall ex D.Don.</i>	-		Medicinal plant			x			B14
	<i>Hedyotis corymbosa</i>	Phak Khome					x			B27
Rubiaceae	<i>Hedyotis fusticiformis (Pit.) Phamhang</i>	-		Medicinal plant			x			B14
Rubiaceae	<i>Hedyotis hispida Retz.</i>	-		Medicinal plant			x			B14
Sterculiaceae	<i>Helicteres isora L.</i>	Po vit		Medicinal plant			x			B14
Sterculiaceae	<i>Helicteres angustifolia L.</i>	Po khee kai		Medicinal plant			x			B14
Malvaceae	<i>Hibiscus rosa - sinensis L.</i>	Ton soi deng		Decorative plant			x			B14
Apocynaceae	<i>Holarrhena pubescens (Buch-Ham.) Wall ex D.Don.</i>	Mouk nhai		Stem used for firewood			x			B14
Maranthaceae	<i>Holopterygia blumei (Koern,) K. Schutt.</i>	Tong ching		Decorative			x			B14
Araceae	<i>Homalonema tonkinensis Engles,</i>	Bon pa kang		Medicinal plant			x			B14
Euphorbiaceae	<i>Homonoia riparia Lour.</i>	Ton kai		The tree can be planted along the river bank for soil erosion protection			x			B14
Dipterocarpaceae	<i>Hopea ferrea Pierre in Lane.</i>	Mai khaen hin	E	Good timber			x			B14
Dipterocarpaceae	<i>Hopea odorata Roxb.</i>	Mai khaen hua	V	Good timber			x			B14
Dipterocarpaceae	<i>Hopea pierrei</i>	Mai La Aen		Building materials			x			B27
Asclepiadaceae	<i>Hoya macrophylla BL.</i>	Dok tang		Decorative plant			x			B14
Asclepiadaceae	<i>Hoya obovanta Done in DC.</i>	Dok tang		Decorative plant			x			B14

Dennstaedtiaceae	<i>Hypolepis punelata</i> (Thunb.) Mett. Ex Kuhn	-		Decorative fern			x			B14
Poaceae	<i>Imperata cylindrica</i> Beauv.	Nha kha		Medicinal plant. Leaves can be used for house roofing	x		x			B14; B27
Convolvulaceae	<i>Ipomoea batatas</i> (L.) Lamk.	Mun dang		Edible tube and young leaves			x			B14
Irvingiaceae	<i>Irvingia malayana</i> Oliv. Ex A. Benn	Mai bok		Timber, charcol and firewood making	x		x			B14; B27
Runiaceae	<i>Ixora stricta</i> Roxb.	Ton khem deng		Decorative plant			x			B14
Oleaceae	<i>Jasminum nervosum</i> Lour.	Khua sai kai		Medicinal plant			x			B14
Euphorbiaceae	<i>Jatropha curcus</i> L.	To mak gnau		Can be planted for fence making			x			B14
Myristicaceae	<i>Knema furfulacea</i> Aust.	Mai luad nhai		Stem used for firewood making			x			B14
Myristicaceae	<i>Knema pierrei</i> Wab.	Sa luad		Stem used for firewood making			x			B14
Palmae	<i>Korthaisia taciniosa</i> Mart.	Wai ta leuk		Young shoot can be eaten raw or cooked. Stem used for furniture making			x			B14
Lythraceae	<i>Lagerstroemia calyculata</i> Kurz	Mai peuy		Timber			x			B14
Lythraceae	<i>Lagerstroemia floribunda</i> Jack.	Mai peuy		Timber			x			B14
Lythraceae	<i>Lagerstroemia macrocoxarpa</i> Wall.	Ka ka lau		Stem used for firewood and fence making. Decoration			x			B14
Araceae	<i>Lasia spinosa</i>	Mak Tapiak		Food	x					B27
Araceae	<i>Lasia spinosa</i> (L.) thw,	Phak nam		Young shoot can be eaten cooked			x			B14
Fagaceae	<i>Lasianthus hispidulus</i> Drake.	Khan heo nok kho khon		Decorative			x			B14
Leeaceae	<i>Lasianthus kerri</i> Craib	Kankeo nok kho		Medicinal plant			x			B14
Rubiaceae	<i>Lasianthus poilanei</i> Pit	Kankeo nok kho		Medicinal plant			x			B14
Leeaceae	<i>Leea aequata</i> L.	Tang kai khon		Medicinal plant			x			B14
Acanthaceae	<i>Leea indica</i> (Burm.f.) Merr.	Tang kai		Decorative plant			x			B14
Sapindaceae	<i>Lepidagathis hyalina</i> Nees.	-		Decorative plant			x			B14
Sapindaceae	<i>Lepisanthes rubiginosa</i>	Mak Luat / Mak Houat		Food		x				B27
Rubiaceae	<i>Lepisanthes tetraphylla</i> (Vahl.)	Mak huad		Decorative plant			x			B14
Fagaceae	<i>Lithocarpus bacgiangensis</i> (Hick.&Cam) A. Cam.	Ko ta mu		Timber			x			B14
Fagaceae	<i>Lithocarpus lindieyanus</i> (A.D C) A. Cam	Ko ta mu		Timber			x			B14

Lauraceae	<i>Lithocarpus megastachya</i> Hick.&Cam	Ko ta mu		Timber			x			B14
Onagraceae	<i>Litsea cubeba</i> (Lour.) Pers.	Si khai ton		Medicinal plant			x			B14
Palmae	<i>Livistona saribus</i> (Lour.) Merr. & Chev.	Ton kho		Edible young shoot and fruit. Decorative plant			x			B14
Cucurbitaceae	<i>Ludwigia ocovalvis</i> (Jack.) Raven	Nha luk na		Decorative			x			B14
Solanaceae	<i>Luffa cylindraica</i> (L.) M.A. Roem.	Mak bop		Edible fruit and young shoot			x			B14
Solanaceae	<i>Lycopersicon esculentum</i> (L.) Mill.	Mak den		Edible fruit			x			B14
Euphorbiaceae	<i>Lycopersicon esculentum</i> var <i>cerariforme</i> Alef	Mak den noi		Edible fruit			x			B14
Lycopodiaceae	<i>Lycopodium cernua</i> (L.) Flanco. & vasc.	Kud kheekhep		Decorative fern			x			B14
Schizacaceae	<i>Lygodium flexuoxum</i> (L.) SW.	Phak kud khua		Decorative fern			x			B14
Schizacaceae	<i>Lygodium polystachyum</i> Wall. & Moore	Kud ngong		Decorative fern			x			B14
Schizacaceae	<i>Lygodium salie ifoilium</i> Presi.	Phak kud khua		Young shoot can be eaten raw or cooked			x			B14
	<i>Lygodium</i> spp.	Phak Good Ngong					x			B27
Myrsinaceae	<i>Macaranga denticulata</i> (BL.) Muell-Arg.	Tong khop		Stem used for firewood			x			B14
Polypodiaceae	<i>Macrosorum hancockil</i> (Bak) Ching	-		Decorative fern			x			B14
Myrsinaceae	<i>Maesa indica</i> Wall.in Roxb.	Ton ton Khup		Medicinal plant			x			B14
Euphorbiaceae	<i>Maesa membranacea</i> A.DC	Ton khup		Medicinal plant			x			B14
Euphorbiaceae	<i>Mallotus barbatus</i> Muell - Arg.	Tong ta ven		Stem used for firewood			x			B14
Euphorbiaceae	<i>Mallotus macrostachyus</i> (Miq.) Muell-Arg.	Tong tau		Stem used for firewood			x			B14
Euphorbiaceae	<i>Mallotus repandus</i> (Willd.) Muell-Arg.	-		Stem used for firewood			x			B14
Anacardiaceae	<i>Mallotus thorellii</i> Gagn.	Mai sae		Stem used for firewood			x			B14
Anacardiaceae	<i>Mangifera indica</i> Linn	Mak muang		Timber, Edible fruit and young shoot			x			B14
Euphorbiaceae	<i>Mangifera silvatica</i> Lec.	Mak muang paa	D	Timber, Edible fruit and young shoot			x			B14

Anacardiaceae	<i>Mangifera spp.</i>	Mak Muang Paa		Food	x					B27
Bignoniaceae	<i>Manihot esculenta Crantz.</i>	Man ton		Edible tube, Young shoot and flower can be eaten cooked			x			B14
Melastomataceae	<i>Markhamia stipulata</i>	Ton khae		Edible flower			x			B14
Marsileaceae	<i>Marsilea crenata Presi</i>	Phak vaen		Young shoot can be eaten raw or cooked			x			B14
Meliaceae	<i>Melastoma normale D. Don.</i>	En a		Fruit used for dye making			x			B14
Melastomataceae	<i>Melastoma sp.</i>	Peuada (k)		Medicine		x				B27
Melastomataceae	<i>Melia azedarach L.</i>	Ka dau sang		Stem used for firewood making			x			B14
Melastomataceae	<i>Memecylon edule Roxb.</i>	Muad ae		Stem used for firewood making, Medicinal plant			x			B14
Melastomataceae	<i>Memecylon fruticosum King.</i>	Sa muad ae		Stem used for firewood making			x			B14
Lamiaceae	<i>Mentha aquatica L.</i>	Phak kan kam		Edible leaves, medicinal plant			x			B14
Convolvulaceae	<i>Merremia pierreii (Gagn) Phamhoangho</i>	-		Decorative plant			x			B14
Convolvulaceae	<i>Merremia subsessilis (Gagn) Phamhoangho</i>	-		Decorative plant			x			B14
Convolvulaceae	<i>Merremia vitifolia (Burm.f) Hall.f</i>	Khua khee kaduan		Decorative plant			x			B14
Rutaceae	<i>Micromelum integerrimum (Buch Ham) Roem</i>	Ka be khon		Medicinal plant			x			B14
Poaceae	<i>Microstegium ciliatum (Trin) A.Camus</i>	Nha sai		-			x			B14
Papilionoideae	<i>Milletia sp.</i>	Mai hae		Stem used for firewood making			x			B14
Mimosoideae	<i>Mimosa diploricha C. Wright ex Sauvalli</i>	Nam keo		-			x			B14
Mimosoideae	<i>Mimosa pigra L</i>	Ka thin nam		Medicinal plant			x			B14
Mimosoideae	<i>Mimosa pudica L</i>	Nha gnup		Edible fruit after cooking			x			B14
Rubiaceae	<i>Mitragyana diversifolia (G.Don) Havil</i>	Mai luang		Timber			x			B14
Rubiaceae	<i>Mitragyana rotundifolia (Roxb) O.Ktze</i>	Mai thom		Timber			x			B14

Rubiaceae	<i>Morinda tomentosa Heyn</i>	Nho khok		Stem used for firewood making			x			B14
Papilionoideae	<i>Mucuna pruriens (L) DC</i>	Khua tum nhae		Poisonous plant			x			B14
Tiliaceae	<i>Murutiga calabura Linn</i>	-		Decorative, ripe fruit can be eaten			x			B14
Musaceae	<i>Musa acuminata Colla.</i>	Kouay pa		Edible young shoot			x			B14
Musaceae	<i>Musa nana Lour.</i>	Kouay suk kheo		Edible fruit			x			B14
Musaceae	<i>Musa rosacea Jacq.</i>	Kouay nam		Edible fruit			x			B14
Rubiaceae	<i>Mussaenda cambodiana Pierre</i>	Dok mieng ka bua		Decorative plant			x			B14
Acanthaceae	<i>Nelsonia compestris R,Br</i>	-		Decorative plant			x			B14
Sapindaceae	<i>Nephelium lappaceum L.</i>	Lum nhai pa		Timber, ripe fruit can be eaten			x			B14
Solanaceae	<i>Nicotiana tabacum L</i>	Nha doud		Poisonous plant			x			B14
Lauraceae	<i>Nothaphopebe umbellifera</i>	Yang Bong		Income & exchange	x					B27
Acanthaceae	<i>Nueracanthus tetragonostachyus Nees in Wall</i>	-		-			x			B14
Ochnaceae	<i>Ochna intergerrima</i>	Mai sang nao		-		x	x			B14; B27
Lamiaceae	<i>Ocimum basilicum L</i>	Phak I tou		Medicinal plant			x			B14
Olacaceae	<i>Olax scandens Roxb</i>	Khouay siek		Medicinal plant			x			B14
Hemodoraceae	<i>Ophlopogon peliosanthoides W.& Arn.</i>	-		-			x			B14
Papilionoideae	<i>Ormosia pinnata (Lour) Merr</i>	Mai khee mu		Stem used for firewood and fence making			x			B14
Bignoniaceae	<i>Oroxylon indicum (L) Vent</i>	Mai Lin Mai		Young fruit can be eaten cooked		x	x			B14; B27
Poaceae	<i>Oryza sativa L,</i>	Khau		Edible seed			x			B14
Melastomataceae	<i>Osbeckia chinensis L.M</i>	Khang hee hak		-			x			B14
Oxalidaceae	<i>Oxalis corniculata L</i>	Som seng ka		Edible leaves			x			B14
Melastomataceae	<i>Oxyspora paniculata (D.Don) DC</i>	En a dong		Decorative plant			x			B14
Poaceae	<i>Oxyteranthera albociliata Munro</i>	Mai lai		Young shoot can be eaten cooked.Stem used for house building and fence making.			x			B14
Poaceae	<i>Oxyteranthera parvifolia Br.</i>	Mai sod		Young shoot can be eaten cooked.Stem used for house building and fence making.			x			B14

Papilionoideae	<i>Pachyrrhizus erosus (L) Urban</i>	Man phau		Edible tube			x			B14
Rubiaceae	<i>Paederia consimilis pierre ex. Pit</i>	Khua tod ma noi		Medicinal plant			x			B14
Rubiaceae	<i>Paederia scadens (Lour) Merr</i>	Khua tod ma nhai		Medicinal plant			x			B14
Sapotaceae	<i>Palaquium sp.</i>	Yang bong deng		The bark for glue making			x			B14
Pandanaceae	<i>Pandanus furcatus Roxb,</i>	Chieng na		Decorative plant			x			B14
Pandanaceae	<i>Pandanus spp.</i>	Daij/Taij		Tools & Handicrafts		x				B27
Pandanaceae	<i>Pandanus spp.</i>	Toei / Teuay		Tools & Handicrafts		x				B27
Poaceae	<i>Panicum sp.</i>	Nha nhoung		-			x			B14
Magnoliaceae	<i>Paramichelia bailonia (Pierre) Hu</i>	Cham pa pa		Good timber			x			B14
Dipterocarpaceae	<i>Parashorea stellata Kurz</i>	Mai hau		Good timber			x			B14
Mimosoideae	<i>Parkia sumatrana Miq</i>	khon kong		Timber			x			B14
Passifloraceae	<i>Passiflora foetida L</i>	Nod sa		Medicinal plant			x			B14
Scrophulariaceae	<i>Paulownia fortunei Hemsl</i>	-		Stem use for common implements and firewoods			x			B14
Rubiaceae	<i>Pavetta indica L</i>	Tom khem kao		Decorative plant			x			B14
Tiliaceae	<i>Peltace burmanica Kurz</i>	Si siet		Medicinal plant		x	x			B14; B27
Caesalpnioidae	<i>Peltophorum dasyrrachis (Miq) Kurz</i>	Mai sa phang		Timber, stem used for firewood making			x			B14
Poaceae	<i>Pennisetum setaceum Forssk.</i>	Nha hang ma		Decorative plant			x			B14
Menispermaceae	<i>Pericampilus glaucus (Lamk) Merr</i>	Khua tup tua		Medicinal plant			x			B14
Lauraceae	<i>Phoebe lanceolata Nees</i>	Phai ven		Stem used for firewood making			x			B14
Lauraceae	<i>Phoebe tavoyana Hook f.</i>	Sa phai ven		Stem used for firewood making			x			B14
Maranthaceae	<i>Phrynium plancetarium (Lour) Merr.</i>	-		Decorative plant			x			B14
Euphorbiaceae	<i>Phyllanthus emblica L</i>	Ton kham pom		Medicinal plant, edible fruit		x	x			B14; B27
Papilionoideae	<i>Phyllodium punchellum (L) Benth</i>	Ked lin		Decorative plant			x			B14
Solanaceae	<i>Physalis angulata L</i>	Mak tum tup		Decorative plant			x			B14
Piperaceae	<i>Piper betle L</i>	Phou		Medicinal plant			x			B14
Piperaceae	<i>Piper lolot C. DC</i>	I leud		Edible leaves			x			B14
Piperaceae	<i>Piper mutabile C. DC</i>	Sa phou		Decorative plant			x			B14
Polypodiaceae	<i>Platynerium grande A. Cunn. Ex</i>	Nhee va		Decorative fern			x			B14

	<i>J.Sm</i>								
Plumbaginaceae	<i>Plumbago indica</i>	Pid pi deng		Good medicinal plant			x		B14
Commelinaceae	<i>Pollia thyrsoflora (BL) End & Hassk</i>	Nha kap		Decorative plant			x		B14
Annonaceae	<i>Polyalthia sp.</i>	Mak kouay hen		Stem used for firewood			x		B14
Polygonaceae	<i>Polygonum chinensis L</i>	Som phian		Edible young stem			x		B14
Polygonaceae	<i>Polygonum tomentosum Wild</i>	Pak phai khon		Decorative plant			x		B14
Sapindaceae	<i>Pomatia pinnata J.R & G.Forst</i>	Ko ka		Timber			x		B14
Araceae	<i>Pothos scandens L,</i>	Wai sa noi		Decorative plant			x		B14
Acanthaceae	<i>Pseuderantherum palatiferum Radlk</i>	Sa hom		Decorative plant			x		B14
Mayrtaceae	<i>Psidium guajava Linn</i>	Mak si da		Edible fruit, Medicinal plant			x		B14
Caesalpniaceae	<i>Ptelobium intergrum Craib</i>	Sa nam ka chai		Decorative plant			x		B14
Dennstaedtiaceae	<i>Pteridium aquilium (CL.) Kuhn</i>	Phak kud		Decorative fern			x		B14
Pteridoideae	<i>Pteris insgnis Mett.</i>	-		Decorative fern			x		B14
Papilionoideae	<i>Pterocarpus macrocarpus Kurz</i>	Mai dou		Good timber	x		x		B14; B27
Sterculiaceae	<i>Pterospermum heterophyllum Hance</i>	Mai ham ao		Timber			x		B14
Fagaceae	<i>Quercus kerrii Craib</i>	Ko kaek		Stem used for firewood making			x		B14
Rubiaceae	<i>Randia spinosa BL.</i>	Ngieng douk		Stem used for firewood making			x		B14
Rubiaceae	<i>Randia tomentosa BL.in DC</i>	Nam theng		Stem used for firewood making			x		B14
Rubiaceae	<i>Randia uligiosa (Retz) DC</i>	Loum phouk		Stem used for firewood making			x		B14
Apocynaceae	<i>Rauvolfia cambodiana Pierre ex Pit.</i>	Kh yom phou		Decorative plant			x		B14
Araceae	<i>Rhaphidophora decursiva (Roxb) Schott</i>	Khua mum soi		Decorative plant			x		B14
Palmae	<i>Rhapis laosensis</i>	Sarn		Food	x				B27
Palmae	<i>Rhapis Macrantha Gagn.</i>	San		Edible young shoot. Decorative plant			x		B14
Anacardiaceae	<i>Rhus chinensis Muell.</i>	Mak phod		Edible fruit			x		B14
Euphorbiaceae	<i>Ricinus communis L.</i>	Hung sa		Poisonous plant			x		B14
Phytolacaceae	<i>Rivina humilis L.</i>	Toum tuak		Edible young shoot			x		B14
Boraginaceae	<i>Rotula aquatica Lour.</i>	Khai hang nak		Decorative plant			x		B14
Rosaceae	<i>Rubus multibracteus Levl. & Van.</i>	Mak thum		Edible fruit			x		B14

Acanthaceae	<i>Rungea pectinata</i> Nees.	-		Decorative			x			B14
Poaceae	<i>Saccharum officinarum</i> Linn.	Oi		Sugar			x			B14
Poaceae	<i>Saccharum spontaneum</i> Linn.	Lau		Young shoot can be eaten cooked			x			B14
Poaceae	<i>Sacciolepis angusta</i> Stapf.	-		Decorative plant			x			B14
Caesalpinioidae	<i>Salaca declinata</i> (Jack.) Miquel.	Kham pha am		Stem used for firewood. Decorative plant			x			B14
Mimosoideae	<i>Samanea saman</i> (Jack.) Merr.	Mai sam sa		Timber. Decorative plant			x			B14
Meliaceae	<i>Sandoricum koetjape</i> (Burm.f.) Merr.	Ton tong		Timber. Edible fruit	x		x			B14; B27
Euphorbiaceae	<i>Sapium discolor</i> Muell-Arg.	Mai pang		Timber			x			B14
Rubiaceae	<i>Sarcocephalus cordatus</i> Miq.	Kok kan luang		Timber. Medicinal plant			x			B14
Actinidiaceae	<i>Saurauja nepaulensis</i> DC.	-		Decorative			x			B14
Euphorbiaceae	<i>Sauropus pierrei</i> (Beille.) Croizat.	Phak ban dong		Edible leaves			x			B14
Sterculiaceae	<i>Scaphium macropodium</i> (Miq.) Blum.	Ka mak haeng		Stem used for firewood			x			B14
Theaceae	<i>Schima wallichii</i> (DC) Korth.	Mai khai so		Good timber			x			B14
Cyperaceae	<i>Scleria purpurascens</i> Steud.	Khom pao nhai		Decorative plant			x			B14
Cyperaceae	<i>Scleria terrestris</i> (L.) Fossett.	Nha khom pao		Decorative plant			x			B14
Scrophulariaceae	<i>Scoparia dulcis</i> L.	Khon Khee thang		Medicinal plant			x			B14
Selaginellaceae	<i>Selaginella strigosa</i> Bett.	Tin kup kae		Decorative fern			x			B14
Leguminosae	<i>Senna (Cassia) siamea</i>	Phak Khisome		Food	x					B27
Leguminosae	<i>Senna alata</i>	Bai Khilek Yai (Bai Khinon)		Food		x				B27
Papilionoideae	<i>Sesbania grandiflora</i> (L.) Pers.	Dok khae khao		Flower eaten cooked			x			B14
Sapindaceae	<i>Shleichera trijunga</i>	Mak Kor Som		Food	x					B27
Dipterocarpaceae	<i>Shorea obtusa</i> Wall.	Mai chik		Timber		x	x			B14; B27
	<i>Shorea obtusa and shorea siamensis</i>	Khi Si			x					B27
Dipterocarpaceae	<i>Shorea siamensis</i>	Mai Si		Building materials	x					B27
Dipterocarpaceae	<i>Shorea siamensis</i> Miq.	Mai hang		Timber			x			B14
Malvaceae	<i>Sida acuta</i> Burm.f.	Nha khad		Medicinal plant			x			B14
Malvaceae	<i>Sida rhombifolia</i> L.	Nha khad		Medicinal plant			x			B14
Caesalpinioidae	<i>Sindora siamensis</i> Teysm. ex Miq.	Mai tae nam		Good timber			x			B14

Smilacaceae	<i>Smilax bracteata Presl.</i>	Nha hua		Decorative plant			x			B14
Smilacaceae	<i>Smilax china L.</i>	Khua kuang		Edible young leaves			x			B14
Smilacaceae	<i>Smilax glabra Roxb.</i>	Nha hua		Medicinal plant			x			B14
	<i>Smilax spp.</i>	Kheua Khuang					x			B27
Smilacaceae	<i>Smilax spp.</i>	Hua Ya Luang		Medicine	x					B27
Solanaceae	<i>Solanum capsicoides Allioni</i>	Mak khua kun		Edible fruit. Medicinal plant			x			B14
Solanaceae	<i>Solanum ferox L.</i>	Mak euk		Edible fruit			x			B14
Solanaceae	<i>Solanum melongena L.</i>	Khua ham ma		Edible fruit			x			B14
Solanaceae	<i>Solanum torvum Swartz.</i>	Khaeng faa		Edible fruit		x	x			B14; B27
Solanaceae	<i>Solanum trilobatum L.</i>	Khaeng khom		Edible fruit			x			B14
Asteraceae	<i>Sphaeranthus indicus L.</i>	-		Decorative plant			x			B14
Asteraceae	<i>Sphaeromorpha australis (Less.) Kitam.</i>	-		Decorative plant			x			B14
Verbenaceae	<i>Sphenodesma amethystina P.Dop.</i>	Khua ka deng		Decorative plant			x			B14
Verbenaceae	<i>Sphenodesma thorelii P.Dop.</i>	Khua ka deng		Decorative plant			x			B14
Asteraceae	<i>Spilanthes paniculata Wall. ex DC</i>	Phak kad		Young can be eaten cooked. Medicinal plant			x			B14
Anacardiaceae	<i>Spondias lakhonensis Pierre.</i>	Som ho		Timber. Edible young shoot and fruit			x			B14
Anacardiaceae	<i>Spondias oxillaris Roxb.</i>	Mak mu		Timber. Edible young shoot and fruit			x			B14
Anacardiaceae	<i>Spondias pinnata (Koenig & L.F.) Kurz.</i>	Mak kok		Edible fruit	x		x			B14; B27
Moraceae	<i>Streblus asper Lour.</i>	Nam khee haed		Stem used for firewood making. Decorative plant			x			B14
Moraceae	<i>Streblus ilicifolia (Kurz.) Corn.</i>	Nam khee haed		Stem used for firewood making. Decorative plant			x			B14
Moraceae	<i>Streblus taxoides (Heyne.) Kurz.</i>	Nam khee haed		Stem used for firewood making. Decorative plant		x	x			B14; B27
Acanthaceae	<i>Strobilanthes flaccidifolius Nees</i>	Hom ban		Leaves used for dye making			x			B14
Loganiaceae	<i>Strychnos nuc-vomica L.</i>	Toum ka		Medicinal plant. Stem used for firewood making			x			B14
Loganiaceae	<i>Strychnos sp.</i>	Toum ka khua		Medicinal plant.			x			B14
Styracaceae	<i>Styrax tonkinensis (Pierre.) Craib. ex Hardw.</i>	Sa nhan		Medicinal plant.			x			B14
Myrtaceae	<i>Syzygium chlorantum Duthi.</i>	Va daeng		Timber.			x			B14

Myrtaceae	<i>Syzygium cumini</i> (L.) Druce.	Mai va		Timber.			x			B14
Myrtaceae	<i>Syzygium semaragense</i> (BL.) Merr.	Mak chiang		Timber.			x			B14
Myrtaceae	<i>Syzygium tinctorium</i> (Gagn.) Merr. ex Pierre	Va dong		Timber.			x			B14
Myrtaceae	<i>Syzygium zeylanicum</i> (L.) DC.	Ton sa mek		Edible young leaves			x			B14
Apocynaceae	<i>Tabernaemontana corumbosa</i> Roxb. ex WALL.	Phout paa		Decorative plant			x			B14
Taccaceae	<i>Tacca chantrieri</i> Andre.	Poum mien		Decorative plant			x			B14
Caesalpinioideae	<i>Tamarindus indica</i> L.	Mak kham		Timber. Edible fruit and young shoot			x			B14
Asteraceae	<i>Taraxocum officinalis</i> (L.) Web	Sa nad		Medicinal plant			x			B14
Dryopteridaceae	<i>Tectaria stenosemioides</i> C.Chr. Tard	-		Decorative fern			x			B14
Verbenaceae	<i>Tectona grandis</i> L.F.	Mai sak		Good timber			x			B14
Combretaceae	<i>Terminalia bellirica</i> (Gaerth.) Roxb.	Mai hen		Timber			x			B14
Combretaceae	<i>Terminalia</i> spp.	Ban Loat		Food	x					B27
Dilleniaceae	<i>Tetracera indica</i> (Chr. & Pans.) Merr.	San khua		Decorative plant			x			B14
Datisceae	<i>Tetrameles nudiflora</i> R.Br.	Mai phoung		Timber		x	x			B14; B27
Vitaceae	<i>Tetrastigma crassipes</i> Plach.	Khua houn pae		Stem can be used for string making			x			B14
Thelypteridaceae	<i>Thelypteris nudata</i> (Roxb.) Morton	-		Decorative fern			x			B14
Malvaceae	<i>Thespesia lampas</i> (Cav.) Dalz. & Gibbs.	Po lom pom		Stem used for firewood			x			B14
Apocynaceae	<i>Thevetia peruviana</i> (Pers.) Merr.	Ka dan nga		Decorative plant			x			B14
Acanthaceae	<i>Thunbergia grandiflora</i> (Rottl.) Roxb.	Khua nam nae		Decorative plant			x			B14
Poaceae	<i>Thysanolaena maxima</i> Ktze.	Khaem		Inflorescences can be used for broom making		x	x			B14; B27
Menidpermaceae	<i>Tiliacora triandra</i>	Kheua Ya Nang		Building materials		x				B27
Rutaceae	<i>Toddalia asiatica</i> (L.) Lamk.	Khua ngu hua		Medicinal plant			x			B14
Ulmaceae	<i>Trema orientalis</i> (L.) BL.	Po hu		Stem used for firewood making			x			B14
Araliaceae	<i>Trevesia sphearocarpa</i> Glushv. & Skvorts	Tang nhai		Decorative			x			B14

Cucurbitaceae	<i>Trichosanthes tricuspidata</i> Lour.	Mak khee ka		Poisonous plant			x			B14
Araceae	<i>Typhonium flagelliforme</i> (Lodd.) BL.	-		Decorative plant			x			B14
Rubiaceae	<i>Uncaria macrophylla</i> Wall.in Roxb.	Nam ko bai nhai		Medicinal plant			x			B14
Rubiaceae	<i>Uncaria scadens</i> (Smith.) Hutch.	Khua nam ko		Medicinal plant			x			B14
	<i>Unknown sc.name</i>	Mai so ngong		Timber			x			B14
Papilionoideae	<i>Uraria crinata</i> Desv.	Hang sua		Decorative plant			x			B14
Malvaceae	<i>Urena lobata</i> L.	Khee on		Medicinal plant			x			B14
Annonaceae	<i>Uvaria macrophylla</i>	Khua phi phon		-			x			B14
Rhamnaceae	<i>Ventilago paucifolia</i> pit.	Khua ngou hau		Decorative plant			x			B14
Asteraceae	<i>Vernonia cinerea</i> (L.) Less	Nha thon phid		Decorative plant			x			B14
Asteraceae	<i>Vernonia volkameriaefolia</i> Wall ex DC.	Nha thod phit		Medicinal plant			x			B14
Loranthaceae	<i>Viscum heyneanum</i> DC.	Ka fak tieu		Decorative plant			x			B14
Verbenaceae	<i>Vitex peduncularis</i> Wall.	Tin nok		Timber			x			B14
Verbenaceae	<i>Vitex pinnata</i> L.	Tin nok		Timber			x			B14
Rubiaceae	<i>Wendlandia tinctoria</i> (Roxb.) DC.	Mai kao		Stem used for firewood making			x			B14
Apocynaceae	<i>Wrightia pubescens</i> R.Br.	Mai mouk		Timber			x			B14
Sapindaceae	<i>Xerospermum moronhianum</i> or <i>Nephelium hypoleucum</i>	Mak Khor Laen / Mark Ngaew		Food	x					B27
Sapindaceae	<i>Xerospermum moronhiartum</i> (BL.) BL.	Mak ngeo		Timber. Edible fruit			x			B14
Mimosoideae	<i>Xylocarpus xylocarpa</i> (Roxb.) Taubert.	Mai deng		Good timber	x		x			B14; B27
Rutaceae	<i>Zanthoxylum rhetsa</i>	Mai Khaen		Building materials	x	x				B27
Poaceae	<i>Zea mays</i> Linn.	Sa li		Edible fruit			x			B14
Zingiberaceae	<i>Zingiber officinale</i> Roscoe.	Khing		Medicinal plant. Edible tube			x			B14
	<i>Zygygium cumini</i>	Mai Va					x			B27
Rhamnaceae	<i>Zyziphus mauritiana</i> Lamk.	Mak ka thun		Edible fruit			x			B14

Annex 5: Globally Threatened Species in Lao PDR

Total Number of Species	Threatened Species			Extinct Species	
	Critically Endangered	Endangered	Vulnerable	Extinct	Extinct in the Wild
	5	7	5		
			3		
			1		
1743	5	7	9	0	0
Total Number of Species	Threatened Species			Extinct Species	
	Critically Endangered	Endangered	Vulnerable	Extinct	Extinct in the Wild
172	4	8	22		
651	5	2	15		
66	2	5	4		
37			4		
244					
	2	3			
		1			
1170	13	19	45	0	0

[Source: IUCN redlist of endangered species, JICA environmental profile Lao PDR](#)