



The study on the potential of eco-tourism as an alternative for sustainable forestmanagement: A case study of Phou Pheung, Phou Pha Thoun-Tad Kuang Si Protection Forest Area in Luang Prabang, Lao PDR

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Abstract

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The objectives of the study are to (1) explore the "attractive places and stories of space" for promoting eco-tourism including unique nature, history, culture and beliefs, handicrafts, and food in Phou Pheung -Phou Pha Thoun-Tad Kuang Si Protection Forest Area (PPT-PPTA), and (2) to recommend potential activities to be promoted and possible options to be supported on eco-tourism in PPT-PPTA as an alternative sustainable forest management. The survey and focus group discussion were used for household interviews and the GPS was used for the survey on the potential of trekking trial and the significant of attraction potential for eco-tourism development. The study's result shows a rich nature and ethnic cultural heritage, including waterfalls, floras, faunas, ethnic festivals of Khmu and Hmong New Year, traditional ethnic Hmong and Khmu food and beverage. Therefore, the area of PPT-PPTA could be promoted for eco-tourism to link the famous destination of Kuang Si waterfall as alternative sustainable forest management.

Keywords: Sustainable forest management, Protection forest area, Biodiversity and eco-tourism

1. Introduction

The concept of eco-tourism was raised in early 1970s and it has been defined as a form of natural tourism, and conservation tourism that benefits the locals. In the new aspects, the concept of eco-tourism includes ecological, economic, and community participation. The government of Lao People Democratic Republic (Lao PDR) proposes eco-tourism development as a key to generating income for local residents, raising an awareness of environmental conservation, promoting local production and protecting ethnic culture and traditions (Sharma, Sood & Chaudhary, 2020).

Lao PDR has a population of more than 7.013 million (MOPI, 2021) and in 2016, it reveals the highest percentage of forest land in Southeast Asia (68%) compared to Malaysia

(62%), Indonesia (52%), Vietnam (44%), and the Philippines (26%). Lao PDR, recently has been recognized as one of the industry-based development nations resulting in the decline in the amount of forest land area. Therefore, it is seeking its own responses to combat the deforestation and forest degradation. Lao PDR has participated in numerous programs Reducing Emissions from Deforestation and Forest Degradation (REDD) related payment ecosystem service schemes (Chien, 2019).

Phou Pheung, Phou Pha Thoun-Tad Kuang Si Provincial Protection Forest Area includes more 36,000 hectares (thirty-six thousand hectares of forest land area in the three districts in Luang Prabang Province: Luang Prabang, Xieng Nguen and Nan Districts) (PAFO, 2015). The government of Lao PDR has

clear policy for forest land area of Kuang Si waterfall since 1982 and declared the area of Kuang Si waterfall as a national park in 1984 and became a biodiversity conservation in 1993 (Lau, 2021). There are 9,669 hectares of forest land area in Kuang Si waterfall and 16 hectares are recognized as the forest land area for tourist destination (PAFO, 2017). The protection area in Luang Prabang Province is more than 60 % of total land area. Therefore, Department of Agriculture and Forestry- (DOAF) of Luang Prabang cooperated with F-REDD zoning the protection area of Phou Phueng, Phou Pha Thoun Tad-Kuang Si waterfall begins with 34,000 hectares in 2017 and it is necessary to manage the forest land in a sustainable way (JICA, 2017).

Kuang Si waterfall is in the protection area of PPT-PPTA, it is 26 kilometers away from Luang Prabang town, and it is the most attractive waterfall in Lao PDR. There are more than 500 tourists visiting Kuang Si waterfall daily (DOICT, 2018). Eco-tourism is an effective mechanism to encourage local participation in forest management. Therefore, the result of the study will contribute to facilitate the dialogue among stakeholders including the public and private sectors and the local communities to invest eco-tourism in this area. The objectives of this paper is to explore "attractive places and stories" for promoting eco-tourism including unique nature, history, culture and belief, handicraft and food in PPT-PPTA. Then recommend potential activities to be promoted and possible options to be supported on eco-tourism in PPT-PPTA.

2. Materials and Methods

Qualitative research is applied for the data collection and GPG was also used for a survey the potential trekking routes in the study area. The number of 13 Villages were selected in three districts, including five villages in Luang Prabang districts, four villages in Xieng Nguen District, and four villages in Nan Districts. GPS was used for the survey the most interesting attractive such as waterfalls, viewpoint, rivers, biodiversity and attractiveness. This study selected 25 informants from community leaders, representatives of villagers, enterprises and

government agencies to understand the phenomena of cultural, natural, historical, industrialized and artisans potential for eco-tourism in three linkages district of Luang Prabang, Nan and Xieng Nguen District.

3. Results

3.1 Tourism Activities in PPT-PPTA

Tourism activities and attractions in the area of PPT-PPTA includes Kuang Si waterfall, community-based tourism (Operating by Tiger trial) in Xieng Nguen District, Nam Dong Park tourist (Nature-based attraction), Strawberry farm, Tad Thong waterfall, Khacham waterfall, Long Lao trekking to Kuang Si waterfall, and Nong Khuai Eco-tourism, and new tourist attraction development of Tao-Kham water park in Nan district. It is interesting to note that tourism activities helps preserving environment and local culture, and also generate economic income for locals, private companies and public both direct and indirect. Therefore, benefits from nature-based tourism and recreation are for current and future generation, for instance income from entrance fee of the tourist visiting Kuang Si waterfall since 2015-2018.

The capacity of Kuang Si waterfall is fully packed and overload, a part of this study is to find out the sustainable solution for forest management, and introduce new tourism activities and distribute fair economic benefit for all people in the area of PPT-PPTA. It is also a great opportunity for locals to understand the value of nature and culture preservation, and also value added of the agricultural production.

The trekking route from Ban Long-Lao to Kuang Si waterfall was established since 2000, and recently Tiger Trial Company cooperates with the community by operating volunteer group of students building a bungalow and managed by the locals. The income from hospitality could be used for operating community-based tourism fund. From Long Lao to Kuang Si waterfall is four hours trekking. 1,120 People live in Long Lao Kao and Long Lao Mai. They are mainly Khmu and Hmong ethnic group. There are more than three thousand hectares of forestland, there are about 700 tourists passed this village.

3.2 Candidate Trekking Routes in the Protection Forest Area

The survey and interview was conducted during March to May, 2019. The aims of the survey designed to understand the feasibility of eco-tourism and ensure locals can share fairly benefit from eco-tourism development.

The study was conducted bases on the scope of the study to understand the potential of eco-tourism resources in 13 villages. Six routes were designed and 85 villagers and community leaders, 6 private sectors and NGO and 9 participants from government agencies participated in this research interview. There are rich of natural, cultural, historical tourism resources, industrialized and craft man in the survey area in the PPT-PPTA.

Thunbergia laurifolia of the figure 2.2 is easily founded in the area, and locals use this flora for food and medicine. For the figure 2.3 *Thunbergia laurifolia* is used as vegetation and it is also a respected flower for some group of Khmu clan. Oral historical and cultural resources are also very interesting evident, including the story telling of origin of human being (Khmu version), story of Vietnamese army and how locals won the battle by using lime stone, story of golden turtle of Nan water spring.

The major incomes of the villagers are from agricultural production, crops [animal livestock, Coix Seed, and rice], non-timber forest product (NTFP), tourism, weaving and embroidery. The end of the cultivation, people celebrate New Year and festivals, such as Hmong New Year, Khmu New Year and Lao New Year.

The first route of the survey was determined bases on the scope of the study to understand the potential of eco-tourism resources. From February - April, this survey was conducted and GPS was used. It results that it is six kilometers from the main street and there are rich of river bio diversities, crabs, medicinal plants, special trees and people are Khmu. Houi Thao is also under watershed protection area where water supply tank of Xieng Nguen district, this water supply station serves for more than 6 thousand population.

Tacca chantrieri is known as Phon-Men in Lao language, it is used as Khmu recipe as well as traditional medicine for diabetes treatment. Houi Thao stream also has more than four beautiful waterfalls in the village. The most interesting river biodiversity are easily founded in the river are water crabs, fresh water algae and fish. Houi Thao is based on the four streams flow to Nam Khan River. Therefore, fish from Namkan River are easily found along the Houi-Thao stream.

However, fish and fresh water crabs and other eatable plants can be endangered, since the increasing of food hunters who are affected from Nam Khan Dam resettlement villagers from Ban Sa-Mak-Kee Say. Local Houi Thao people faced difficulty at the beginning to stop using chemical fertilizers and pesticides for their crops and agricultural plantation. Houi Thao is only a village in the PPT-PPTA recognized as clean and organic agricultural production.

There was a private company, Yod Dao Consulting Company proposed to operate Zip lines business and restaurant on the rice field at the upstream of the village, but the villagers and local government of Xieng Nguen district are not agreed with the proposal of the company.

Therefore, community participation in development process is very important for sustainable development. Community-based tourism is a tool for economic development and help preserving natural and cultural heritage.

Tadkong and Tadhoi are based on the national street No. 2051 along the Mekong River, it is 35 kilometers from Luang Prabang, Tad kong can be developed to offer more optional tourist destination for the tourists to explore. Tourists can explore variety activities when travelling from Luang Prabang to Nong bouakham such as Mekong cruise, visiting buffalo farm, experiencing local livelihood along the street [Ban Ou, Paksi, rice field and pineapple farm]. It can be linked to Kuang Si waterfall and Buffalo farm. There are still a lot of rice fields, interesting location of the villages' base on Mekong River and they are volunteer resettled village with mixed ethnic culture, Khmu and Tai Speaking ethnic group.

Our survey team started from Nong Bouakham walked up to Ban Yang along Houi Siew stream. Houi Siew is a main river that people from four villages use for irrigation, consumption and fishing. Wangmon is the biggest reservoir in Siew stream and it is an important pond for river biodiversity to help conserving fish population, shrimp and crab. It is respectful reservoir where locals believe Naga lives there as a protector. The challenge for eco-tourism in this particular location is the forest degradation of the watershed forest from slash and burn livelihood practices. Houi Siew is the biggest stream in the area could be risky in the future to be draught from forest degradation and forest extraction in the area of watershed area. Local people believe that at the water spring of Houi Siew has white fish [channa gachua] is respect as the protector of the river.

Nong Bouakham Village also has a great tourism potential to establish trekking route along Houi Siew River up to Yang village. It takes about 4 hours to trek up to the Houisiew stream, there are also mixed livelihood practices, including crop, rice and livestock farming. Biodiversity and river needs to be conserved carefully in order to ensure sustainable forest management practices.

Yang Village is also on the list of land use planning of Forestry Department, under the support from Centre for Human Ecology in the Highland (CHESH, 2017). However, Yang Village still challenges for increasing of migrant workers to Thailand. Bases on geography of the village, Yang village is land lock, there is only one way to access to Yang village through one season road access after kuangsi waterfall, but Yang village has rich natural and cultural resources as eco-tourism potential. It is highly recommended to establish the linkages trekking route from Yang village to spring water of Si River, Kuang Si waterfall. It takes about four hours to explore medicinal plants, wildlife and experiencing bamboo and cotton weaving from Yang villagers.

Tourism development and zoning Kuangsi waterfall as a protection area and five villages were resettled in 1995. The forest land from Ban Yang to Nam Ork (water spring) there are many

small streams and plenty of vegetation, fruit and natural medicinal plants. An hour walking from Yang Village to kuangsi waterfall spring, in the trekking trial there are variety of plants, including Alocasia sp, Gmelina arborea, Calamus sp. (Rattan palm), Bambusa and amomum group.

This area is the part of reforestation project of Luang Prabang province after community resettlement in 19995. Before arriving at the water spring of Namsi, there are many interesting oral history of Hmong village, romantics' story of the mountains, and listening to the birds singing.

Ban Yang should become a hub of eco-tourism, where Ban Yang has great potential to operate community-based and educational tour on forestry and culture of Lao Tai speaking and operating trekking to Nan and Xieng Nguen districts. From Ban Yang to Ban Touhor [Hmong Village], there is still ever green forest area which is a good for trekking and at the rest point on the mountain also has oral story of Vietnamese volunteer was killed during the American war in Laos.

Trekking with this route, the tourists would experiences three different ethnic culture, including Lao Tai of Ban Yang, Hmong in Ban Touhor and Khmu in Phatonglom and Houi Oun.

Nam Pak is the name of the stream, the largest evergreen forest area and longest route of the survey. It takes two hours to travel by local tractor passes through the community animal raising camp and touching the moisture from the stream, another six hours trek to the ever-green forest. Villager reported that there are about 200 trees were logging from March to May, 2019.

Operating eco-tourism activity would help reducing deforestation practices and also tourists will help guarding the forest for the government. The government has to pay for village guard to watch and protect the forest. Operating nature-based tourism activity would help saving government expenditure and generate economic income for current generation and also benefit for future generation.

3.3 Village Profiles

Nine respondents were selected from

government agencies, including representatives of Information, Culture and Tourism Office, Public work and Transportation, Agriculture and Forestry, 5 respondents are from tour operators, hospitality and related businesses such as Tiger Trials, Nam Dong Park, Strawberry farm, Green Discovery, Sang Fun Eco-tourism Development Project in Nan District, 2 respondents are

representatives from local NGO and an eco-tourism specialist, including Bears Conservation Center (BCC). The research team uses the conceptual framework of eco-tourism potential to conduct a study; it results positively to develop eco-tourism activities as a solution for forest management in the area of PPT-PPTA.

Table 2.8 Result of the study bases on the scope of eco-tourism potential

No	Thematic items	Candidate items
1	Natural Resource	waterfalls, caves, Big trees, Floras [<i>Gmelina arborea</i> , <i>Erythrina subumbrans</i> , <i>Thunbergia laurifolia Linn</i>], medicinal and consumeable plants [<i>Amomum sp</i> , <i>Redstake climber</i>], fisheries [<i>Kaloula pulchra</i> , leaf frog or cocoa frog, terrestrial frog, small frog, frog, toad, <i>Clarras batrachus</i> , <i>Channa gachua</i> , <i>Channa striata</i> , <i>Cyclocheilichthys enoplos</i> , <i>Cyprinus rubrofuscus</i> , <i>Puntius stoliczkanus</i> , shrimp, <i>Monopterus albus</i> , <i>Macronathus siamensis</i> , <i>Mastacembelus armatus</i> , <i>Hemibagrus aff,nemurus</i> , <i>Hemibagrus</i> , snail, <i>Macropodus opercularis</i> , <i>Bagarius yarrelli</i>], viewpoints and wildlife animals
2	Cultural Resource	Religious events, Festivals and multiple tradition and culture of different ethnic groups and local knowledge,
3	Historical Resource	Oral stories about golden deer from Kuang Si waterfall, Pa-Tuhor, it is translated as a gate of Hor-Chinese who travelling with their treasure and had a break at this area and a story of Vietnamese volunteers who sacrifices himself for communist party; he was killed by Chao Fa. Finally, Chao Fa (Opposite side of Hmong rebel) was lost, because of local knowledge of Communist party, using the limestone as a trap to overcome the battle. This route is possible to arrange trekking tour from Ban Yang to Ban Tuhor. Additional story is about French treasure in Ban Houi-Thao.
4	Industrial Resource	Crops, Job's tears, soy beans, corns, livestock, rice, wooden carving, fisheries, NTFPs
5	Craft man	Bamboo weaving, music instrument, artisans, embroidery

The people from three districts previously have concept of borderland as the line for limitation for livelihood practices, logging and hunting. However, for a new conceptual framework for sustainable development under the umbrella of eco-tourism is to break though the borderland and unify the people from buffer zone into under the same shadow of umbrella of eco-tourism development.

Bases on the surveyed and interviewed by research team to understand the potential of eco-tourism resources in PPT-PPTA from 13 villages. Therefore, the village's profile would contribute to the policy makers and development

agencies to determine where to conduct a pilot project on sustainable eco-tourism development project.

4. Discussion

The finding confirms that there is a high potential for operating a pilot project on eco-tourism development in the area of PPT-PPTA. There are still rich of natural and cultural potentials, including waterfalls, florals, faunas as well as colorful ethnic diversities; Khmu New Year and Hmong New Year in December and Lao Tai speaking New Year in April. Therefore, Eco-tourism development is potentially proposed, and eco-tourism development has also

potential to revive local knowledge and cultural practices such as knowledge and skill of food and beverage, cotton and silk and farming from ethnic group. 98% of the respondents are based on traditional agricultural practices. The second source of income generation are mainly from fishing, weaving, NTFPs, and food and drinks.

A lesson learned from Nam Ha Eco-tourism development project 'eco-tourism development can be used as integrated approach for community development, contributes in preserving natural heritage, revive tradition and culture, helps protecting environment, with in capacity building of professional communication, languages skills and hospitality is a part of sustainable tourist satisfaction and positively impacts to sustainable eco-tourism' (Lyttleton, 2002). Natural and cultural resources from 13 villages are mainly waterfalls, caves, viewpoints, floras, faunas and ethnic livelihoods, embroidery, weaving. However, 98% of the villages were selected for the survey really needs to improve the infrastructure. For historical, industrial and craft man resources are also interesting note that oral history related Kuang Si waterfall and Vietnamese volunteers are highlighted.

The first trekking from the main street No. 13th to Houi Thao village, it is about six hours trekking and possible for biodiversity and Khmu cultural learning center, then the second trekking route would recommend to develop agro-tourism with Upland Livestock Research Station, in which linkages from Touhor as a Hmong Village to Ban Yang Village where is crossed the cross evergreen forest and this area needs to be well preserved before it will be too late, because more 200 big trees were under illegal logging. The study of Nalivanh and Prompaping (2018) reminds to develop eco-tourism carefully that tourism development in Vangvieng really contributes positively impacts to economic development. However, it is necessary to plan in order to prevent the negative impacts of tourism on ecosystem services related to natural resources from construction of tourist destination and facilities, hotels, restaurants on the river banks, Pollutions from tourist activities and land use changes.

5. Conclusion

All thirteen villages from the survey, interview team and comments from stakeholders on, it can be concluded that each village has different potentials for developing eco-tourism and **Houi Thao Village** is the first village to be recommended for a pilot eco-tourism development project. Ban Houi Thao is 3.5 kilometers from the main street to the village and has more floras and river animals such as crabs and shrimp. Houi Thao River is the main stream with another eight small streams as the important water sources for long term consumption and irrigation. The eight streams of the water sources are included Houi Lern, Houi Pong, Houi Lieng, Houi Takang, Houi Dok Thong, Houi Mo, Houi Sakhan, Houi Thao Noy.

Eco-tourism could be a good activity to contribute economic income, cultural and natural preservation. Watercress is high demand for local and tourism market, and clean water source could be a great potential for producing fresh and organic watercress for tourists and community market. However, there is still lack of specialist who focuses on how to improve the quality and increases the production of watercress to satisfy the market needs for both community and tourism sectors in urban Luang Prabang. Since Houi Thao is a free-pesticide village, it has a great potential to raise bee for honey, and encourage locals to grow natural floras those are existed in the community. It is also a great potential for health-based tourism, it is known as eco-therapy and promote for long stay tourists. However, technical assistances and marketing are the key issues to achieve the goal. It is only a village was declared as non-chemical fertilizers and pesticides in which a great opportunity to promote as a model eco-tourism and clean environment among 42 villages under PPT-PPTA. From the survey and interview, there are 27 households are interested in participating in poultry organic farming, 10 households are interested in raising organic pig, 12 households are interested homestay business, 10 households are interested in planting fruit trees and bamboo plantation.

It would be great to turns the village landfill into beautiful waterfall and Houi Thao

Community-Based tourism should be a model for zero plastic waste in near future and it is the best way to help preserving water resource and creating river basin profile of Houi Thao as a branch of Nam Khan River. Bases on the result of the survey and outcome of the consultation discussion with stakeholders on 26th June, 2019, it is agreed that the most important key for successful of the project development is to ensure the development still continue after ending of funding. Existing strategy, means a strategy bases on scientific analysis, and linkages of three districts for community benefits and carefully prevent resource conflicts among communities: Therefore the first step is to start working with Upland Livestock Research Station (ULRS) to promote organic farming and analyze the needs of the market, then produce the uniqueness of organic products, including vegetables, garlics, and job's tears seed and could be education center of upland agriculture and wildlife preservation center of Fresh Water Turtles, crabs and other river biodiversity from Nan River Basin.

6. Conflict of Interest

We certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

7. Acknowledgments

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Table 2.1. income from tourists visiting Kuang Si waterfall (2015-2018)

No	Year	No. of tourist (time)	Lao Foreigner	Total income (LAK)
1	2015	78,594	189,020	4,566,340,000
2	2016	57,934	148,279	3,544,920,000
3	2017	68,838	181,451	4,317,400,000
4	2018	72,296	231,029	5,343,480,000
Grand total		277,662	749,779	13,662,440,000

Source: Finance Department of Luang Prabang Province, Lao PFR (2019)

OVERVIEW MAP

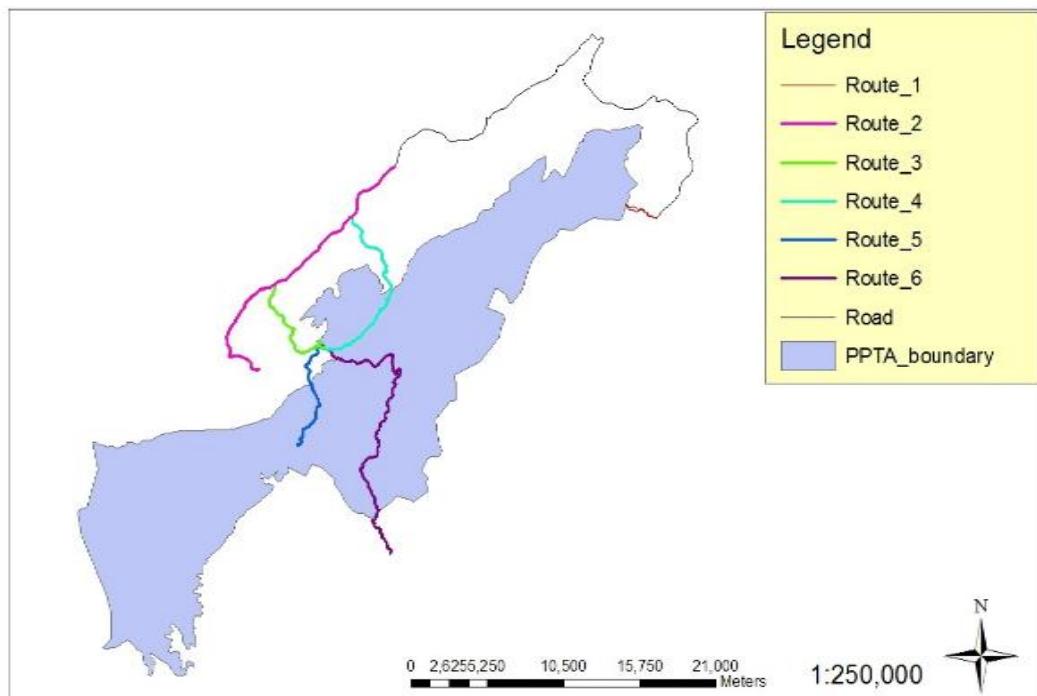


Figure 2.1. Six routes were surveyed, bases on PPT-PPTA map



Figure 2.2 *Thunbergia laurifolia*



Figure 2.3 *Trevesia palmata*



Figure 2.4 Tacca chantrieri Medicinal plants



Figure 2.5 Waterfall



Figure 2.6 Tad Kong waterfall

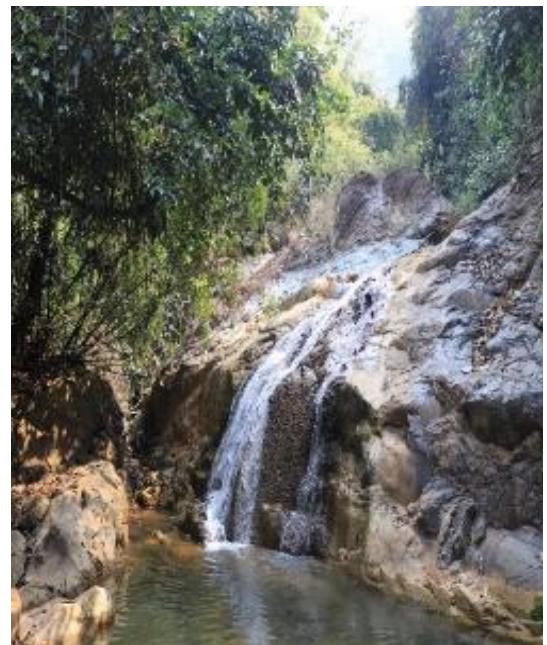


Figure 2.7 Tad Hoi Waterfall

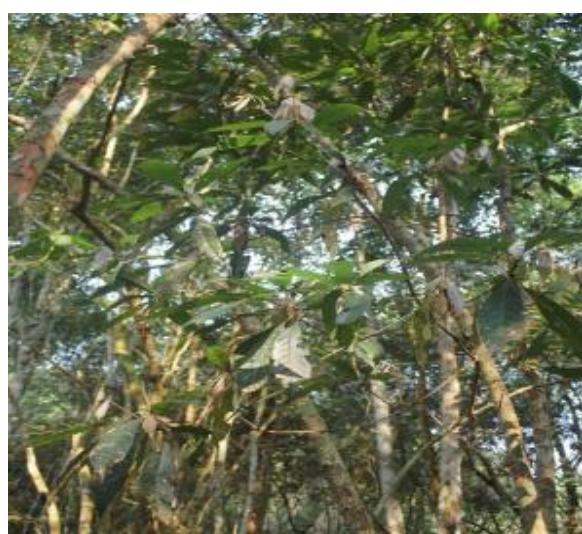


Figure 2.8 Bai Tong Plant, stops poisoned food



Figure 2.9 Gmelina arborea, flower can be used for cookies



Figure 2.10 Rice basket maker both male and female can make



Figure 2.11 endangered risky in extinct flora, called **Dendrobium sp**



Figure 2. 12 the largest logging timber area among three districts



Figure 2.13 turtle and other ten wild animals are risk in extinct in PPT-PPTA