



Forest Issues in Yok Don National Park



Internship Report

Antoine Le Prêtre

AgroParisTech – ENGREF

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Supervisor: Assoc.Prof. Dr. Bao Huy

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1. Introduction

1.1. Presenting myself and my formation

My name is Antoine Le Prêtre, I am a student in an engineering school of forestry in France. I have already passed a Master (5 years) in environment, ecology, biodiversity and evolution. I continue my studies in order to be specialized in forestry and natural ecosystems management. The school in which I am now is called: “Formation des Ingénieurs Forestiers (FIF)” (Engineering Forestry Formation) located in Nancy (France) and belong to a network of schools in the field of agriculture which is called “AgroParisTech (APT)”. This school is the only one in France which proposes an engineering formation in forestry in 3 years. Concerning my case, I integrated this school in second year because I am already graduated from the university (MSc Level = Master Level; 5 years).

The targets of the formation are numerous: to know about forests in France and in the world, history, economy, management, ecology, conservation, biodiversity or social issues... We have lectures as well as a lot of practical on the field in several departments in France. The internship of second year had to be done in a foreign country and that is why I am in Vietnam today. This school also proposes a specialization about natural ecosystems management. I will follow this formation the next year and finish it by an internship of 6 months.

1.2. Targets of the internship

During this internship of six weeks several targets are raised. Actually, the main target is to know and to learn about forests in Yok Don National Park (YDNP) located in Dak Lak Province in Vietnam. In this national park, there are 150 000 ha of forest. 4000 ha are devoted to ecotourism. The rest of the forests are protected areas. I realized this internship with the FREM, forest department of Tay Nguyen University (Buon Ma Thuot city).

To realize this target several purposes are raised:

1. To know about forest community in YDNP.
2. To know about ecotourism in YDNP
3. To know about biodiversity and wildlife management in YDNP.
4. To know about forest ecology of YDNP.

Different methods are used in order to answer the objectives. In this report, I will explain what are these methods and the results I could obtain using these methods. Finally I will develop comments and recommendations about the subjects I deal with here.

I realized this study with three others students from Malaysia.

Table 1: Internship time table

Time/Date	Activities/Programmes	Where and Whom you work with
4 – 5 July	Forest Ecology	In the natural forest of Yok Don
7 – 8 July	Wildlife Conservation and Protected Area Management	In the natural forest of Yok Don Discuss with the staff of Yok Don
11 – 12 July	Ecotourism Management	Visit Buon Don Tourist site Discuss with Center of Tourist of Yok Don
13 – 15 July	Community Forest Management	Discuss with the staff of Yok Don Visit Drang Phok Village (in the core zone of Yok Don)

2. Forest community

Several Ethnic minorities are living into YDNP. Their permanent contact with the forests leads a lot of issues. The use of the forest is as well for wood features, medicines, foods or cattle grazing. However, the villagers have to respect some rules of the National Park. Thus, it is sometimes difficult for them to adapt. In this section, I will treat about the issues of forest community and will try to find solutions in order to improve the incomes and livelihoods of the ethnic communities.

2.1. Materials and methods

In order to have information about forest community, we had the chance to meet an ethnic minority living in YDNP in the the Drang Phok composed of Z'rai, M'nong and Ede. To know more about the habits of this population, we prepared a questionnaire for them (Cf. annex 1). With the help of Dr. Huong as a translator, from FREM department, we could understand the answers.



Photo 1: Interview in the Drang Phok Village.

2.2. Results, comments and recommendations about Drang Phok villagers:

This village is an ethnic minority village in Vietnam created 1000 years ago. When YDNP was created in 1992, the government wanted to expulse the villagers from it because it wanted to protect the forest against villager's activities. But the villagers did not agree and finally they could stay into the forest. The area where is situated the village is a sensitive zone: the border with Cambodia is very close (about 30 Km).

It is inhabited by 98 persons. Twenty years ago, the village was inhabited by 58 persons. It means that the population increased very quickly. There is a primary school in the village but no high school. If the pupils want to study more they need to move away. This is a problem for the population who does not like to leave her village.

Before the creation of Yok Don, the population obtained incomes from the forest products: they removed wood, medicine plants; they hunted animals (elephants...) and so on... For the creation of the YDNP, they are not allowed anymore to do it. The main resource of incomes for the villagers became agriculture (rice, corn...). They are also really dependent of the Serepok River (for water and fishing). The chief of the village explained that they could have authorization from the authorities to remove wood from the forest and build houses or features. When we asked to the staff of YDNP if the villagers are allowed to take wood in the forest they said that they are not. It means that there is a problem of communication between the villagers (they said that they can have authorization to take wood) and the staff of YDNP (they said that even with an authorization they villagers are not allowed to take wood in the forest). It could be a good thing to explain to the villagers once again the rules of YDNP: what are they allowed to do in it and what they cannot do.



Photo 2: The Serepok River; an important element for survival.

The authorities tried to establish a plan of tree plantations 7 years ago for the villagers. The plan failed because the villagers did not want to do it. The villagers just want to do agriculture and hope to obtain more hectares to plant corn

or rice. Actually, they have 60 ha of cultivated area. With the increase of the village population they would like to obtain 40 ha more to do agriculture. Agriculture seems to be expensive according to them (fertilizers...). With the increase of the population, villagers need more areas to do agriculture. Then, they could get more incomes to obtain enough livelihoods. The problem is that agriculture encourages them to log the forest. It could be a good thing to introduce them others methods to get incomes (like frog growth).

The authorities give support for the village. The problem is that the only person who takes advantages from those benefits is the village's chief. It means that the situation for the others villagers does not change. We can imagine that it does not encourage them to take care about the forest. I think that a better way to protect the forest from the villagers logging should be to spilt the supports between the villagers. If villagers understand that if they don't cut trees they will obtain money, they maybe could stop logging.

When we asked them why they would like to protect the forest, they answered: "because we want to keep wood for the generation futures and to have money from the authorities". When we asked about biodiversity, the chief was not able to answer. An awareness campaign into the village could be done: villagers need to understand that stop cutting trees in the forest is not only good because they can obtain incomes from the authorities but it is also really important to protect it for ecological and environmental reasons. An awareness easily done, in order the villagers understand, could change their behave towards the forest. It could change their point of view regarding the forest and it could encourages us to stop logging or to do it respecting the natural behave of ecosystems. A system of allocated forest management could also be applied: it could provide incomes for the villagers whom could cut trees reasonably. The forest can be persevered even if villagers are allowed to cut the tree. I mean that if the trees are cutting with the respect of environment, this act should not affect the balance of natural ecosystem.

Another way to develop the village's activities could be to promote ecotourism there. The villagers seem to be very motivated to do it. However, it should maybe difficult to do it, because of the proximity of the Cambodia's

boarder. If the supervision of the area could be enforced, ecotourism for the village should be a good way to develop trade and incomes. The village could be visited, and the villagers could propose several activities such as: boat trip, elephant tour or shopping.

2.3. Results, comments and recommendations about Drech B:

2.3.1. Brief introduction

During the internship we had also the chance to visit Drech B village, situated near to YDNP. In this village we participated to a demonstration done by Dr. Bao Huy in order to explain how villagers can grow frogs and obtain incomes from it (after selling it for food). I think that it is a very good alternative to stop logging, hunting and collecting NTFPs in the wetland in the National Park. The method is quite easy and it means that all villagers can do it even if they have not a lot of knowledge. This method has the advantage to be not expensive at the beginning because the government gives support for the villagers. Furthermore, this method has already been realized with success by villagers.

2.3.2. Procedure

Two kind of way to grow frogs can be realized. The first is to grow frogs in natural area and the second, in artificial ponds. The better way seems to be the “natural way” because frogs growth better (After one month and a half, 5000 frogs; using artificially way: 2000 frogs).



Photo 4 and 5: Net for frog growth; frogs

The frogs are grown into ponds which are surrounded by nets. First, villagers buy tadpoles to a firm (supported the first time by government). They need 200 tadpoles / m². After one month they need 100 – 150 frogs / m². It means that some frogs had to be removed because the density becomes too high and it is very important to take care about that if we want to keep frogs alive. The frog weight increases after 10 days about 3 g / day. At the end, a benefit of 320 \$ is obtained. The spending (for net, food...) is about 240 \$. It means that the incomes will be about 80 \$.

While growing the frogs, several factors had to be taken in account for frog survival:

- Water Ph: 6,5 – 7,5;
- To change regularly water for the artificial way in order to avoid enrichment of water;
- To keep the water clean (to be careful with pesticides or fertilizer into the water);
- To keep fresh water;
- To feed frogs two times a day. No more, because too much food can kill the frogs;
- To keep the food away from moistures.

If the villagers are able to success the experience the first time, they could be able to realize it alone the next times. It means that they will be totally independent to get incomes from it. This method seems to be a very good way to reduce logging.

3. Ecotourism

3.1. Materials and methods

In this part we will deal with ecotourism in YDNP. As we did with Drang Phok village, we did interviews with the team working in YDNP (Cf. Annex 2). We also visited the different places for ecotourism in YDNP.

3.2. Results, comments and recommendations

Ecotourism in YDNP represent an important aspect of the park. Indeed, the incomes coming from ecotourism are used to promote conservation project. Each month, 40 to 60 tourists come in YDNP. The most of them are coming from European countries and some of them often study forestry. Tourists from Vietnam do not seem to come a lot in YDNP. They don't look very interested by forest, because forest is everywhere in Vietnam according to the staff of YDNP. The hot weather in the Highlands of Vietnam also does not encourage tourists to come there.

Per year, tourism represents an income of about 600 Millions of Vietnam Dongs. 150 employees work for ecotourism in YDNP (included guides, elephant keepers, shops, restaurants...).

16 rooms are available to sleep into YDNP. Several places and activities are proposed for the tourist:

- Visiting the forests (deciduous or evergreen) and waterfall by foot, bicycle or motorbike;
- Elephant tour;
- Boat trips;
- Bon Don Village: an ethnic minority who became a "shop village" with ecotourism. The bamboo bridges of Bon Don Village.



Photos 6 to 9: Ecotourism activities in YDNP: Elephant tours; Hotel; Bike tours; Bamboo bridge.

According to the staff, tourism is not well developed in YDNP. It means that regarding others place in Vietnam, the number of tourist per year and the incomes obtained from them are not so important. To attract tourist in YDNP, it could be a good thing do more publicity using internet for example. It could be a good idea to open a rescue center for biodiversity and show the animals to the tourists (like in Cat Tien National Park), which are not easy to find into the wild. In one hand, it could permit to attract more tourists and in another hand it could be a good solution for biodiversity conservation and for the awareness of local and foreign population. The help of a nongovernmental organization such as WWF to build a such project could be a good way to complete it and maybe to obtain the funds. Such projects have already been realized in Cat Tien National Park. The local people could also participate for a such project looking for animals.

In YDNP, staff is not always able to speak English (this can be a problem for develop ecotourism). A web site should be created too: thanks to a website showing pictures of the Park, the staff, the rooms and explaining which activities

can be done it should encourage the tourist to come there. The quality of the rooms could also be improved particularly regarding the bathroom (water flow is very low). For young European people I think it is not a problem. But older European people like to have more comfortable rooms. Moreover, the staff of YDNP said that very often, only young people comes and stay a night in YDNP. That confirms this fact.

Others activities could be created. An activity which can be enjoyed by tourists is “walking into the canopy”. It could be done building bridges and obstacles into the canopy which could permit a walk to discover the trees, orchids, birds, and insects. Informative panels about forest ecology, plants ecology, animals ecology could be installed. Tourists participating of these activities should ensure by ropes and snap claps. Furthermore, informative panels should be installed everywhere into the tourist area. They could explain a lot of things about the forest issues or YDNP activities. A kind of cultural journey could attract tourists who would like to learn about forest issues (ecology, environment, biodiversity, logging, exploitation and economy, climate change issues) or about traditional activities of ethnic minorities.

Briefly, we can say that ecotourism could be much more developed to get more incomes. It is also a way to learn about forest and biodiversity. Organizing conference or meeting by researcher in YDNP can also be interesting.

4. Forest ecology, biodiversity and wildlife conservation

4.1. Introduction

YDNP is the biggest National Park in Vietnam. It is a territory where there are about 150 000 Ha of forest. It was created in 1991 and is situated on the Dak Lak Province. The west boarder separates Dak Lak commune to Cambodia. The park is situated in the north of Dak Lak Province. This area is situated in the highlands of Vietnam and it means that the topography of the site is flat. The altitude is about 200 meters in average and the culminate point is situated on the Mont Yok Don at 482 meters. The climate is a tropical climate with two seasons:

- The rain season occurs from April to November during which there is a lot of rain.
- The dry season occurs from December to March.



Photo 10: YDNP entrance.

This kind of climate allows the formation of three different kinds of forests, which represent an important factor for a high biodiversity:

- The Dipterocarp / Deciduous Forest which are deciduous forest. 92 % of the protected area is covered by dry deciduous forests. YDNP is the only one national park in Vietnam which has this type of forest.



Photo 11: Dipterocarp forest.

- The semi deciduous forests: They are usually situated along the rivers. The main river in YDNP is the Srepok River; it is watershed of Mekong river system.

- The evergreen forest. In this kind of forest, the level of biodiversity is very high. The climate conditions allow a lot of plant species to grow in it. Thus, high fauna diversity is also allowed to progress. Unfortunately, I had not the opportunity to visit and to collect data in evergreen forest due to the impossibility to go there (impossible to across the river). These forests represent only a small part of YDNP. They are situated on the mountains where the climate allows the evergreen forest to grow.

4.2. Materials and methods: Collecting Data in the forest

The collection of data in the forest was done into the deciduous and the semi-deciduous forest using the transect method. Several types of data were collected in order to learn about the forest:

- Species
- High of tree
- Diameter of tree
- Canopy percentage
- Soil pH
- Soil moisture
- Color of soil
- Abiotic factor
- Position
- Attitude

Each time we could see new specie of tree we had not seen before, all these data were collected.



Photo 12: Inventory day.

4.3. Results and discussion

4.3.1. Deciduous forest

Concerning the deciduous forests, 32 species could be inventoried. The most of the species belongs to Dipterocarp family. We can find species like *Dipterocarpus tuberculatus*, *D. obtusifolius* and *Shorea obtusa*. However, in deciduous forest have the Anacardiaceae, Combretaceae, Fabaceae and Myrtaceae families are also well represented.

Most trees in deciduous forest have thick and fire-resistant bark, protect for lose many water and dry. Fires are however important to ensure the trees regeneration: without fires, some Dipterocarp seeds could not germinate.

In this type of forest, the canopy is not very dense (around 40 % of recovery). The soil seems poor, because the tree size is not very high (11 m in average) and the DBH too (35 cm in average). The pH is generally neutral (7). Very often we could note the presence of worms and aunts. In the deciduous forests, a lot of rocks are often presents. It means that the soil is very poor and very well drained: this one of the factors which is representative of the soil poverty. This fact is confirmed by the low presence of moistures which are representative of microorganism's activities.

4.3.2. Semi deciduous forests

In this type of forest, 21 species were inventoried. There is a diversity of family much more important than in deciduous forest like Fagaceae, Euphorbiaceae, Sapindaceae, Ebenaceae and Meliaceae.

According to the collected data, canopy seems to be densest (27 % of covering). However, the tree size (17 m in average) and the DBH (38 cm) are higher. Furthermore, some trees are very high and have a big DBH. Thus, we can say that in semi deciduous forests the soils seems richer than in deciduous forests (a high presence of moisture confirm also this fact). Furthermore, the water should be more available all the years since these kinds of forests are located close to the watercourse.

In short, we can say that semi deciduous forest seems to be richer than the deciduous one. However, the low level of collected data does not allow us to have a full analysis and cannot be enough to do true conclusions. We can however have a good idea of the forests mentioned before.

4.4. Comments and recommendations

4.4.1. Dipterocarp Forests

They are mainly composed of trees belonging to Dipterocarpaceae family. This kind of trees loses their leaves once in a year during the dry season. During this season, the temperatures are very hot inside these forests: the lack of leaves allows the sunlight to come easily inside the forest and thus, to increase hardly the temperatures. It means also that the soils during this period are very dry and the water spots are very rare. This fact doesn't allow a big fauna diversity to progress into this type of forest. We can also think that during the raining period, fauna is more present than during the dry period. It means that arriving at the dry period, fauna should move to another place, more adapted for their survival. The importance of connections between the natural areas is thus very important to allow the fauna migration and survival.

4.4.2. Semi deciduous Forests

The located microclimate (due to the watercourse proximity) allows both deciduous and non-deciduous trees to grow. Thus, the biodiversity in this kind of forest will be more important than in deciduous forest. This kind of ecosystem, close to the water should be carefully taking in account: this particular ecosystem tends to disappears with climate change (wetland). However, they are the source of a high level of biodiversity and play the role of biologic corridors between the river and the forest. It means that a high quantity of species will use the areas to survive, to feed, to reproduce or to migrate safely. In France, we have a lot of law concerning wetland and ecosystems situated near the water. A high level of protection is often recommended and established for these areas. Thus, logging is often strictly forbidden as any humans activities.

4.4.3. Discussion (Cf. Annex 3).

The level of biodiversity in YDNP is very high. It is represented by one hand the fauna and the flora and in another hand by the diversity of the 3 different types of forests in YDNP (deciduous, semi-deciduous (along river – gallery forest) and evergreen forests); it means that the diversity of ecosystems is also important and thus, each type of forest can house different kind of species. Moreover, a large number of wetlands are now in the forests of YDNP, included wetland into the forests (open area) but also the river bank. This type of natural area should be carefully taking in account by the forest managers; actually, with the ecosystem evolution regarding climate change, these types of area are threatened.

The specific richness in YDNP is an evidence of the ecosystems quality. Thus, it is very important to protect it and in particular the different species included into the red list of Vietnam or IUCN. Actually, several species represented in YDNP are already included into the Vietnam red book or taking in account according to IUCN:

- 28 species of animal listed in Viet Nam red book, and 22 species in IUCN 2006

- 18 species of bird admitted in BirdLife International (2004) with various different levels: Threat or near threat in the world. In the Vietnam red book (2000), some threatened species at the national level, such as:
 - *Pseudibis gigantea*: is threatened in the Critically Endangered (CR)
 - *Motacilla samveasnae* and *Ephippiorhynchus asiaticus* are threatened in Near Threat (NT)
- Botanical: 22 species was recorded in Vietnam red book:
 - Vulnerable : 8 species
 - Threat : 3 species
 - Rare : 2 species
 - Insufficiently known : 9 species
- 16 species plants in Yok Don national park was reported in the list of species that should be protected according to standard of IUCN (2000), making up 1.87% of the total number of Yok Don National Park's plant species, with: Critically Endangered (5 species), Endangered (5 species), Vulnerable (4 species), Near Threatened (1 specie: *Dialium cochinchinensis*), Data Deficient (1specie: *Dalbergia entadoides*).

Several threats for biodiversity are now recognized. In this section, we will explain what these threats are and how to fight against them. Furthermore, we will try to explain how the management can be improved in order to have a better ecosystem management, useful for biodiversity conservation. I would like to say that I take my ideas from the education I had in my country. The management and the education in Vietnam could be different and the ideas I expose here are suggestions which could be reviewed and maybe adapted for Vietnam.

a) Villagers: Threats and recommendations

The main threats concerning the conservation of biodiversity and ecosystems are the pressure of human activities and particularly the villager activities. Actually, the YDNP laws seem to be misunderstood by the villagers (see 2.1.1.), and the communication between villagers and YDNP staff not very good. The threats are: logging, hunting and a high pressure of cattle grazing. I think that there is a big problem of communication between the staff of YDNP and the ethnic community

living into the forest. When asking question to the both (villagers and YDNP staff), they answered differently. To ensure ecosystem and biodiversity conservation with villagers, the best way seems to do awareness campaign. It should be very important for them to know the reasons of the creation of YDNP because they are living in it. Allocated forest system could be established.

Also, limited areas for cattle grazing should be established. A strong pressure of cattle on the herbaceous stratum and on the tree barks could engender damages on the ecosystems. The installation of barrier which does not allow the cattle to go in sensitive places should be done. Furthermore, the cattle should not grazing always in the same place. A rotation of the grazing area should be done in order to let the time of the original herbaceous stratum to regenerate; it is also good to let the time for the tree regeneration to grow without being eaten.

b) Climate change: Threats and recommendations

Another threat for biodiversity and ecosystem could be climate change. The future evolution of climate must be taken into account into the park management in order to prevent a specific and ecosystems richness decrease. First, several studies on the tree ecology should be invested using model applications. In order to know which trees will be able to survive with climate change, models could be used to know:

- The important ecological factors for each species (what are the main limited factors for each species? Rain? Temperatures...?) ;
- The main ecological factors which will change in the future (Rain? Temperatures...?)

Comparing these results, it is possible to know the species which have the maximum of chance to survive or not. Then, a conservation plan for climate change could be established.

Another threat regarding climate change is the disappearance of wetland area. Though, this kind of area is very often biodiversity hotspot. A lot of species living in the forest use the wetland to survive and to reproduce, find food, drink etc. An inventory of the wetland into the forest should be done in order to know how the wetland are spread into YDNP and also to know the water resource of the park.

Then, maintenance should be done to avoid reboisement. Actually, reboisement is a threat for wetland situated into the forest. Indeed, the tree regeneration in the wetland can lead to the disappearance of it. The maintenance can be done by a regular grazing. Indeed, while the cattle eat the seedlings, it could avoid the regeneration of trees and maintain the area opened. It could also be a good solution to guide the villagers in order they know where they can do cattle grazing. In the same time, the cattle should not stay in the same place all the year: it could cause damages for the area.

Furthermore, it is important to keep natural connections (covered by trees) between the wetland. Indeed, these connections are very important to allow the fauna (like amphibians) to migrate between the different wetland and also to avoid consanguinity. During the dry season, the disappearance of some wetland can be a problem for the survival of some species living in it: that is why it is very important these species could find another wetland to survive. Connections between wetland are a chance for them to survive.

c) River bank: Threats and recommendations

River banks are, like wetland area into the forest, a kind of biodiversity hotspot. For the same reason than wetland, it is also very important to take care about banks. One of the threats which can be observed in YDNP is the presence of *Mimosa pigra* L., an invasive species coming from the West Indies. This specie is a real danger for bank biodiversity. When this specie becomes established, other indigenous species cannot grow any more. It means that it could be very important to fight against it.



Photo 13: *Mimosa pigra* L.

Several studies have already been done in Australia, where they have the same problem:

- First, they tried to burn it; the problem is that fire exterminates the plant on the ground surface but exterminates the plant roots. Furthermore, it encourages the seed to germinate. However, if the canopy is removed, the indigenous species growth is encouraged by sun light and could decrease the progression of the invasive species. The problem is that when we use this kind of method to fight against *Mimosa Pigra*, we should cut the canopy. It could cause damages to the natural ecosystem.

- Secondly, they used chemicals. It was a success. The problem is that plants very often grow on the river bank. It means that the watercourse is very close from the invasive area. If chemicals are used, it could be spread into the water and lead to a water pollution which could cause big damages for environment.

- Finally, a biological solution was found. Using different insects (such as *Neurostota gunniella*, *Carmenta mimosa*, *Coelocephalopion pigrae*, *Acanthoscelides puniceus*, *Chlamisus mimosae*), they could have good results. Furthermore this method does not ask a big amount of money. However, it takes a lot of time to have results (several decades) and a previous study should be carefully done in order to know the impacts of the insects on the rest of the ecosystem. Indeed, after *Mimosa Pigra* eradication, this insect could address another plant and damage the ecosystem. That is why it is very important to know how these insects could behave in Vietnam and regarding the indigenous species in YDNP.

In France, a good method to fight against *Fallopia japonica* (an invasive species of river banks), is to use sheep. Indeed, after 3 years the species can be eradicated. I did not find any data concerning grazing against *Mimosa Pigra* but some experimentation could be done in order to know if a cattle grazing could help to fight against the species.

d) Fauna conservation and inventories: Threats and recommendations

In YDNP, no regular inventories are done (such as: camera trap, vestige, footmark, droppings...) to know about the fauna population living into the forest. It can be a good basis to know about wildlife, and the species which evolve in the forest. However, this seems to be insufficient to know precisely about the evolutions of the fauna populations (demography) or about the number of individuals in each population: These are the basis of a good biodiversity management and conservation.

In order to do it, a NGO could help the YDNP staff. Indeed, it exist such system in other Vietnamese National Park such as Cat Tien National Park where the WWF is working. It could be a very good thing to follow rigorously the different animal's types and particularly those are included into the different red books. Collars could be used follow mammals (like wild elephant, monkeys or wild cows) and to know more about their distribution and their favorite areas. An increase of ranger surveillances could be done for these areas in order to prevent the animals against poaching.

Concerning the birds, inventories should be done using their songs. Thus, inventories using only view seems not be sufficient to know exactly about the different populations. It means that the help of specialists should be required (NGO for example).

Concerning amphibians, inventories could be done counting the laying into the wetlands and during the reproduction periods.

All these kind of inventories should be regularly done in order to estimate the evolutions of each population. The knowledge deduced from these inventories could be exposed onto information panels in YDNP explaining the issues and the importance of biodiversity for environment. It could be a good thing to attract tourists who would like to know more about environment in Vietnam and also to participate in the nature and environment protection.

Furthermore, opening a rescue center for the animals should be a very good thing or attract tourist and to participate in the wildlife conservation. Thus, it could on one hand help the threatened species to survive and to grow and in another hand help to get incomes for the national park. As we mentioned it before, the help

of an NGO like in Cat Tien National Park could be a good basis to complete the project.

5. Conclusion

5.1. General

YDNP is a very large area, which has a lot of resources. The diversity of ecosystems like forests, wetlands, river banks is very high. Indeed, the biodiversity related to this ecosystem diversity is also really very high. Today, in a context of the 6th biodiversity crisis, such natural area as YDNP has to be taken carefully in account and to be a place of research development and of a high conservation plan. We could even define this area as a biodiversity hotspot.

However, the projects concerning conservation, ecotourism or community forests could be much more developed. Indeed, the high level of resources in YDNP seems to be not totally exploited for ecotourism and the conservation plan could be also strengthen.

Today, concerning ecotourism, YDNP does not seem to be very attractive because of the big quantities of forests in Vietnam, tourists do not seem to find interest to come in YDNP. The high biodiversity resource (as well ecosystems as fauna and flora) could be the basis of a next attractive information and education project.

Information panels should really be installed in order to interest the tourists and furthermore, it is a very good way to do awareness about the big importance and issues of forests in Vietnam. Moreover, the guides should have a minimum scientist formation in order to inform the tourist about forest and to answer their questions. If ecotourism could be more developed this is a way to get more incomes and thus, to have the possibility to engage more project for forest conservation.

Biodiversity conservation plan should also be developed. First, regular inventories could be established. This is the basis of a good conservation plan: in

order to protect biodiversity we should know it precisely. Specialists for each type of ecosystems or animals should be employed because they know precisely the methods to inventories and to manage them. An assistance of an NGO like WWF could be also sought. They have experience for this subject and could help the YDNP to develop and to protect their resources.

5.2. Impressions about the internship

The internship I realized during one month and a half was a very good experience. The purposes were various and very interesting. I could well feel the different issues of forests in Vietnam and particularly in YDNP. It could be however a good idea to take the next trainee in others places to see other types of forests. No problem for me, I know that the team of FREM is very busy and they have already done a lot of things for me! I think than for the first time they welcome trainees it is very well done! Thanks a lot and I hope to see you again in Vietnam.

6. Annex

6.1. Annex 1 – Questionnaire for Drang Phok Village

- 1- How villagers use the forest? Could they survive without the forest?
- 2- Are the villagers allowed to hunt?
- 3- Are there some areas reserved for cattle?
- 4- What changed for villagers since the creation of the Yok Don NP?
- 5- How feel the villagers since the creation of Yok Don? Can they find benefits or not?
- 6- Is it difficult for them to respect some National Park laws (For exemple: not allowed to cut trees)?
- 7- Are the livelihoods enough since the creation of Yok Don?
- 8- What is the main source of energy for them (to fire they food for exemple) and where can they find it?
- 9- Are the communities totally independent? Do they need support from the staff or government to survive?
- 10- Are they using a lot of energy wood?

6.2. Annex 2 – Questionnaire about ecotourism

- 1- What is the importance of eco tourism in Yok Don (Economy, employment...)?
- 2- How many tourists per years?
- 3- Which activities for tourists?
- 4- Would you like to develop more activities?
- 5- Comparing the others National Parks in Vietnam, How is placed Yok Don?

6- Where are coming from the tourists?

7- What would you like to improve in order to develop this field?

6.3. Annex 3 – Questionnaire about wildlife conservation

1- How the wild life is taking into account in the forest management and what it the conservation method for biodiversity?

2- What are the methods to inventory wild life and how much time it took for inventory?

3- What are the methods to protect wild life (laws, rangers, management, food, limited hunting)? What kind of species can we hunt? Is there a lot of poaching by local population to sold or eat?

4- Is there any non-government organization that supports the protection of biodiversity?

5- What are the methods of enforcement to protect the national park?

6- What are the species you really would like to protect?

7- How many species threatened or rare do you have in Yok Don (regarding UICN scale, red list)?

8- What kind of threats threatened biodiversity (hunt, climate change, villagers...)?

9- What are the biotic and abiotic signs / factors for you which indicate a good environment quality: for biodiversity / wildlife?

10-How do you take into account wet area (Pond, wetland, river bank)?

11-Are there other methods you would like to develop to protect biodiversity?

12-How do you do to limit deforestation (Rangers)?

13-What is the surface deforested illegally per year? Where does it come from (Villagers...)?

- 14-Comparing the others National Park in Vietnam, what can we say about Yok Don?
- 15-Do you have a list of plant species (can we have it)?
- 16-Do you have a list of animals species (can we have it)?
- 17-How to prevent the forests from fire?
- 18-What are the effects on the biodiversity causes by climate change?
- 19-What are the types of forest soils in YKNP (texture, structure, materials...)?
- 20-What is the function of watershed in YDNP (related to biodiversity)?