



**“PRINCIPLES AND PRACTICE OF FOREST RESTORATION  
WORKSHOP FOR LAOTIAN GROUP”  
23 AUGUST – 2 SEPTEMBER 2005,  
FORRU, CHIANG MAI, THAILAND**



**BY THE FOREST RESTORATION RESEARCH UNIT (FORRU)  
SPONSORED BY DARWIN INITIATIVES, U.K.**

- Venue:** FORRU nursery and demonstration plot in Mae Sa Mai  
Chiang Mai University, Chiang Mai, Thailand
- Languages:** English, Lao, and Thai
- Sponsored by:** The Darwin Initiative
- Organised by:** The Forest Restoration Research Unit (FORRU), Biology  
Department, Chiang Mai University
- Joint Organisation:** The Forest Research Center (FRC), Lao PDR

## **Introduction**

In September 2004, Laotian and Cambodian delegates, involved in forest reforestation projects with DANIDA made a short visit to FORRU, which included a presentation about the framework species method of forest restoration and a field visit to demonstration plots at Ban Mae Sa Mai community. The delegates were very interested in FORRU’s work and requested a full workshop for a wider range of delegates at a later date.

Following support gained from Britain’s Darwin Initiative, FORRU in collaboration with East Malling Research, started a project to facilitate restoration of forest ecosystems for biodiversity recovery in Indochina by transferring skills and proven technologies to key forest stakeholders in China, Laos, and Cambodia. This project will assist these countries to design research tree nurseries and experimental plots to adapt the technique to local ecological and socio-economic conditions and demonstrate it to local people.

This knowledge and skills transfer is being achieved through a series of workshops, both at FORRU’s demonstration sites in Thailand, and at participating organizations. The workshop **“Principles and Practice of Forest Restoration Workshop for Laotian Group”** was the 2<sup>nd</sup> of the three workshops that FORRU will host here in Thailand. The workshop contents covered the principles and practices of the framework species method to accelerate biodiversity recovery in planted forests. In addition, a review of FORRU’s protocols and results, particularly nursery techniques and logistic planning were presented. Furthermore, the project outputs, particularly i) organization of a workshop in Lao PDR, ii) input into Forest Restoration and Research Project Establishment Manual and iii) adaptation and translation of “How to Plant a Forest” were discussed.

## Objectives

1. To pass on the concepts and research protocols developed by FORRU-CMU to enable the participants to establish an effective FORRU in Lao PDR.
2. To prepare the participants to run a workshop to plan a FORRU in Lao PDR.
3. To plan adaptation and translation of forest literature into Lao.

## Participants – Total 15 participants

- Mr. Sounthone Ketphanh Deputy Director of FRC
- Mr. Somphachanh Vongphasouvanh Head of Silviculture Section, FRC
- Mr. Khonesavanh Louangsuvahn Silviculture Section, FRC
- Mr. Somphone Phongdalach Silviculture Section, FRC
- Mrs. Theva Ounkeomany Silviculture Section, FRC
- Mr. Khamtanh Khamphanh Head of Tree Seed Improvement, FRC
- Mr. Outhong Vongsay Tree Seed Improvement, FRC
- Mr. Singkone Chaiyalad NTFP Section, FRC
- Mrs. Phayvone Phonephanom NTFP Section, FRC
- Mrs. Sengphet Nhotlusai NTFP Section, FRC
- Mr. Bounsou Sovan Plantation & Reforestation Extension Unit
- Mr. Souksompong Prixar Faculty of Forestry, National University
- Mr. Kouat Silichack Department of Forestry
- Mr. Bouavanh Thavyphone Oudomsay Province, Forestry Office
- Mr. Sonexay Phommavong Bolikhamsay Province, Forestry Office

## Program

Day	Date	Time	Subject	Location
Tuesday	23/08/05	13.00 PM	Arrive and book into UNISERV	Airport
Wednesday	24/08/05	Morning	Objectives of the workshop. Introduction to FORRU and the framework species method. Why are FORRUs needed?	CMU
		Afternoon	Presentations by participants about their own views/experience of tree planting.	CMU
Thursday	25/08/05	Morning	Framework species plots - what can be achieved	BMSM
		Afternoon	Community motivation for forest restoration - session with BMSM natural resources committee.	BMSM
Friday	26/08/05	Morning	Phenology and seed collection in natural forest	Doi Suthep
		Afternoon	Herbarium Visit Phenology data analysis and genetic considerations of seed collection	CMU
Saturday	27/08/05	Morning	Germination, monitoring seedling growth and nurturing wildlings in the nursery	Doi Suthep
		Afternoon	Continue and Wat Pratat temple visit	Doi Suthep
Sunday	28/08/05	All day	FREE DAY	
Monday	29/08/05	Morning	FREE MORNING	
		Afternoon	Analysing seed experiments, Dormancy, Seedling growth, Production schedule	CMU
Tuesday	30/08/05	Morning	Monitoring tree performance. Weeding/fertilizer performance	BMSM
		Afternoon	Vegetation monitoring - field work. Direct seeding..	BMSM
Wednesday	31/08/05	Morning	Planning - time, labour and costs Role Play Scenario for Community A and B	CMU
		Afternoon	Analysing field data. NTFPs, Selecting Framework Species	CMU
Thursday	01/09/05	Morning	Final discussion - planning exercise to set up your own FORRU - location design admin staffing funding	CMU
		Afternoon	Other project components - organizing the in-country workshop,	CMU
Friday	02/09/05		Departure	

## **REPORT ON EVENTS**

### **Welcome Remarks and Introduction on Wednesday 24<sup>th</sup> August 2005**

Participants were welcomed by a speech by Dr. Narit Sitasuwan, Head of Biology Department followed by an introduction to the workshop objectives by Dr. Steve who also presented a session on why Forest Restoration and Research Units are needed.

In addition, forest restoration techniques tested by FORRU such as accelerated natural regeneration (ANR) and the framework species method were explained with PowerPoint presentations. The participants are interested in forest restoration techniques and would like to translate FORRU's textbooks and papers into Lao.

#### **Comments:**

##### **C: Mr. Sounthone from FRC, Lao PDR:**

Our level of English and technical terminology is limited so presentations by all speakers clearly and slowly would be appreciated for better understanding. We come from many parts of the country with various levels of education so it may take time for us to follow and understand.

##### **A: Dr. Steve, FORRU**

We will not be using too many technical terms, but we will explain the general principles so that the Lao participants can practice the techniques at home. Part of this project includes funding for translation of our textbooks into regional languages, including Lao. Knowledge from FORRU's work in northern Thailand can be successfully passed on to other countries. However, differences in the climate and tree floras require adaptation of these methods; hence the need for FORRU's in each eco-region.

### **Presentations by Lao PDR Participants on Wednesday 24<sup>th</sup> August 2005**

The afternoon session provided time for workshop participants to explain the situation with regard to forest restoration in their country. Their talks are summarized below.

#### **1. The Forest Research Center (FRC) by Mr. Sounthone Ketphanh**

**1980**, Lao PDR re-organized the Forestry Department into many sectors.

**1999**, Administrative units.

- The Forest Research Centre (FRC) incorporated within NAFRI
- Department of Forestry
- Medical Plant Research Centre
- Provincial Agroforestry Office
- District Agroforestry Office
- Tree Seeds & Tree Improvement office is responsible for species provenance and in situ and ex situ forest resources conservation

**Problems:**

- Lack of human resources, experts
- Lack of permanent research funds
- Lack of good seedling stock
- English competency

Now FRC acts as a network/hub for research projects, capacity building and liaison with the private sector. Lao PDR produces a lot of timber and non-timber forest products (NTFP's): more than 700 kinds. Only 41-42% of the country is forested.

Natural resources conservation is extending into many local rural areas, but effective processing and marketing of forest products is also a major concern. Lao PDR needs a marketing promotion center. We also need better seed varieties, more research and more co-operation with our brother country, Thailand. We lack qualified research personnel so the Lao government supports the FRC to train capable workers.

**2. Reforestation in Lao PDR by Mr. Sompachanh Vongsouvanh**

In 1940, Lao PDR had about 70% forest cover (16,500,000 ha). Nowadays, forest cover had dropped to about 40% (or about 942,857,143 ha). The main forest types are evergreen, mixed deciduous and bamboo-deciduous. Deforestation is caused by shifting cultivation, legal logging, forest fire and infrastructure developments such as dams and roads. Thus, the Lao PDR government plans to increase the forestry area up to 70% by 2020. The additional planting of 7 million ha will increase more reserved forest, protected forest and production forest. The forest restoration program will zone former forested land into productive trees (tree industrial crops) i.e. teak and others, forest rehabilitation, and tree plantations. Various Dipterocarpus species have been promoted for planting by farmers. During 1975-2004 our forest area has increased because the Lao people gain income from the planted trees and understand the benefits for the environment.

Forestry Research: we are focusing on improvement of seed varieties, techniques in agro-forestry and building better relationships with villagers. Zoning of native forest and usable forest has to be clarified.

Research Problems: Lao PDR has limited trained personnel and technology. Funding agencies often have different objectives to those of the government forest policy.

**Questions & Answers:**

**Q:** Are there any plans to do tree planting on degraded land that belongs to communities?

**A:** There is community participation in the zoning of land for commercial and forest restoration. The community is allowed to plant their chosen species but some specific trees are permitted only in some areas, and the commercial tree will be introduced i.e. teak, rubber and herbs and spices. However, in protected forest zones, there will be no commercial tree species planted.

**Q:** Wildlife trade is illegal in Thailand, but they still sell wild animals at border markets. Is the wildlife trade also illegal in Lao PDR?

**A:** The Lao PDR government does not allow any wild animals for commercial exploitation. However, Thai people still come across border to buy many orchids,

rabbits, and other wild animals. Thailand is a big market for illegal wildlife trading with Laos.

**Q:** Do you have a national seed center? How is seed distributed to the people who need them?

**A:** There are 2 stations that test seed before distribution to farmers. Other stations are working on the tree seedlings i.e. teak, *Pterocarpus* spp. and *Aquillaria crassna*.

### **3. Tree Seeds and Tree Improvement by Mr. Khamtanh Khamphanh**

Seed source management has started with a joint initiative with DANIDA, Denmark by setting up a Seed Centre. The objectives are:

- To survey seed sources in area of 500,000 ha in year 2000.
- To disseminate information by posters and leaflets
- To promote the potential commercial species such as *Aquillaria crassna* to farmers.
- To provide information and collect data on biodiversity

#### **Seed Source Registration**

More than 100 seed sources have been registered over an area of 10,125 ha, with 7,886 trees labeled in 16 provinces. The Lao Tree Seed Project has already studied 24 spp. However, the budget is limited. Furthermore, Champasak and Xaiyaburi provinces are also classified for seed bank areas.

#### **Field trip to study framework species plots Thursday 25<sup>th</sup> August**

The participants visited the community tree nursery at Ban Mae Sa Mai and had discussions with Mr. Neng the nursery man. Later they visited the framework species demonstration plot above the village to learn what can be achieved by the using the technique in 5-6 years. A session of tree planting techniques was also run.

#### **Discussion at MSM Nursery**

**Q:** How did you establish the community tree nursery at Ban Mae Sa Mai? And how do you work with FORRU?

**A:** In the past I used to work with the watershed management unit. We used to plant only pines from the forestry department. We wanted to plant various other native trees in the area, so I was happy when the FORRU come to our village. I collect phenology data from the planted trees and also observe animals that visit the trees once a month.

**Q:** How many people work here?

**A:** In the nursery, I work with my wife and receive a salary from FORRU. For weeding, fertilizer application on the plots workers from the village are hired daily. However, for tree planting volunteers from the village join together with many other volunteers. For fire control, both fire watchers and fire fighters come from the village voluntarily. It is a community activity.

**Q:** Do you have trouble with the villagers who are still need to fell trees for more agricultural land?

**A:** Sometimes, because a few people do not understand the zoning of the forest area. They are not satisfied when we plant trees in the area which they think belongs to them.

**Q:** Do you plan to have training or raising awareness for better understanding?

**A:** Yes, Many meetings. Besides FORRU's meetings, we organize for other villagers come to join with us more and more.

### **Framework Species Demonstration Plot**

This plot is located in the Doi Suthep – Pui National Park, Pongyang district, Maerim, Chiang Mai. Twenty-nine tree species, grown in the village nursery from seeds collected in the park, were planted. We plant for forest restoration. Within 2-3 years, the forest becomes attractive to wildlife because of fruiting and flowering of the planted trees. Within 5 years various other tree species colonize the area from seeds brought in by birds and mammals. The planted forests develop deep leaf litter and shade out weeds creating perfect conditions for tree seed germination.

### **Discussion**

**Q:** Could you provide us with a list of confirmed framework species for this area?

**A:** Yes (in your file already). Thirty six species have been confirmed as suitable framework species from the research in these plots e.g. many fig species for edible fruits, legumes for better soil conditions and oaks which are a common component of natural forest. We also ask villagers what other tree species they would like to plant. However, the framework species list have to suit for the location and should be tested within the native forest condition.

**Q:** How long do you have to do weeding?

**A:** After three years, weeding is not necessary since the tree shade controls the weeds. We do weeding every 6 weeks in the rainy season during the first two years.

**Q:** How about cattle, do they have grazing area here?

**A:** The farm animals are not allowed into the planted areas. Small wild animals can live in the area.

**Q:** Could just ANR (accelerated natural regeneration) be enough?

**A:** Compared with the planted plots, the control plot (which we did not plant) is still dominated by weeds. Seeds dropped in this area don't germinate well or the seedlings die early due to competition from the weeds. We have to bring back both the climax species and the pioneer for forest composition. Natural regeneration areas can become the forest, but the biodiversity will be low and the dry weeds are good fuel for fires. Only pioneer trees grow there.

**Q:** How to select the area to plant?

**A:** The forest area should be connected to each other, however it depends the villagers and the National Park policy. The selection of the site was made by the botanists to keep the native species that appropriate for the site. The number of trees, species, and the site area will be selected by the committee. The villagers used to have troubles with the

project but very rare now since we have a village committee and good information and communication with them. We grow the trees to increase the forest area to make the lowland people understand the highlanders that they love forest too. The swidden farming is not seen anymore in the highlands. We do not tillage the land since our land is high degree of slope and risky of land slide.

**Q:** Do you think the framework technique has already succeeded and how long before you can stop collecting data?

**A:** For evergreen forest, we have really good results and are winding down data collection, since we already got a large amount of data from these plots, which proves that the system can work. Biodiversity monitoring will continue for a while longer. We need to reproduce this in other forest types.

## **Community Motivation Session Thursday 25<sup>th</sup> August Afternoon**

### **Subjects discussed between workshop participants and the committee of Mae Sa Mai, Hmong Village**

#### **1. History of Mae Sa Mai Village**

Ban Mae Sa Mai has been located for 50 years in the Mae Sa Valley and has a population of 1800 people. Lynchee is the main income crop. Vegetables are considered as cash crops and rank as the second highest income now. The whole village member now do conservation to protect the forest in the upper watershed.

In the past, they grew opium, corn, rice and due to water shortages cause by cutting down the forest, they moved lower down the valley for better water resources and started to preserve forest around springs. About 40 families moved down about 30 years ago. Water is the main factor which encourages forest conservation and to follow the suggestion of H.M. King Phumibhol. They have run many meetings to encourage the villagers to understand sustainable use of the forest.

In the past, Hmong people just considered about farming for food. They grew rice for food, opium for trade, corn for feeding livestock and a few vegetables for eating. The big change came when they were short of water and drug enforcement and the Royal Project moved in. At present, there are 2,000 rai of Lynchee trees, 5,000 rai of forest buffer zone, and the farming area for the village in the rainy season about 1,000 rai. Many of them go to Chiang Mai to sell .

The current income is not enough, at the 20,000 baht (266 GBP) per head per year. Many villagers work in town, study in town and grow rice in the lowlands. Farm land in the Mae Sa Valley is now strictly limited but more children are being born. Alternative livelihoods are therefore being planned i.e. ecotourism, cultural tour programs, handicrafts etc. Birth control programs are now in force and more villagers leave to work in the city.

The village has been part of the National Park area since 1981. The NP announcement was made but the headman did not know about the NP announcement. The NP claimed that the village was in the NP. The village name was not on the forestry map. The villagers had to create a conservation club to show that they can live here and protect the forest.

## **Rationale of BMSM Natural Resource & Environmental Conservation Voluntary Club and Community Motivation for Forest Restoration**

In the past, the NP authority worked to prevent forest encroachment and arrest offenders. The forest seedling program using native trees with FORRU began in the past 10 years. The tree planting campaign was to celebrated H.M. the King's Golden Jubilee and encouraged villagers more and more to plant trees near the village.

The aim of the conservation club is to promote a practical way of living in the forest peacefully without destroying the forest.

Beginning with 25 people the conservation club began to conserve the forest by creating fire breaks and providing the public with information. The villagers got the idea and accepted the club's plan for community action on fire prevention. Each family provides people for fire prevention work on a rotational basis January to April 24 hours. All families participate in the program.

The spiritual power, Dong Seng Tree is celebrated every year. This is the untouchable zone for the village spirit live in only site. The villagers worship and respect this site. A spiritual ceremony is run to ask spirits to help prevent fire.

The use of the products from the forest must be considered by the administrative and development committee. The committee will check any trees, which need to be cut and surviving trees must remain around the area. Forest products i.e. mushrooms, bamboo can be harvest for domestic consumption. Firewood can be taken only from pruning of the Lynchee trees.

Meetings are conducted 2-3 times a month. The committee explains to the villagers that to live with the forest we have to plant the trees. The committee has requested assistance from outside agencies i.e. the Royal Project, FORRU. During the past 10 years, the conservation club has more members. The club has more power to talk with the villagers now. FORRU has helped to strengthen the club and helped villagers understand forest restoration and the nature ecology.

## **2. Collaboration between FORRU and the MSM committee**

In addition to supporting the community nursery and demonstration plots, public awareness raising has been done in the school. The FORRU and the students have developed co-operation link at the school and in the forest area. The committee invites government agencies to visit the village and explains the usefulness of the forest and need to protect it.

The fire prevention team gets food from the Royal Project, fuel and other resources from the local sub-district office, and also from FORRU. The fire watch period begins on January 15 every year and last through the rainy season. We did not have enough water in the past, but after the forest restoration began the local climate seems to have become cooler and wetter. Seasonal streams are flowing all year again. We will have food as long as we have forest.

## **Seed Collection and Phenology Field Day Friday 26<sup>th</sup> August**

An introduction to FORRU's research nursery was provided. After that the delegates practiced phenology monitoring for seed production, seed collection and specimen collection for identification of tree species. The session concluded with forest walk to the giant fig tree to observe the natural forest condition on Doi Suthep.

## **Herbarium and Database Friday 26<sup>th</sup> August**

### **Chiang Mai University Herbarium Visit**

The Chiang Mai University Herbarium stores 25,000 specimens and about 4,000 species. In addition, the herbarium holds type specimens of 26 newly discovered species. More than 2,200 specimens are from Doi Suthep-Pui National Park. Ms. Pranee and Mr. Maxwell showed participants the voucher specimens, both dry and wet in alcohol. The topics discussed were how to identify tree species for forest restoration projects. The participants were aware of the importance of accurate tree species identification in forest restoration projects and said they would like to send exchange students to learn about taxonomy and Herbarium.

### **Herbarium Database**

Dr. Greuk Pakkad presented his research about genetic considerations of seed collection, the plant herbarium database and data collection. The discussion about genetic diversity and variation was the main issue that raised interest.

The herbarium database includes taxonomic, ecological, and preliminary nursery production information. From the database, FORRU could identify tree species most likely to meet framework criteria and then test them. The main analysis which is done is phenology data analysis. Phenology data helps to schedule when and where to collect seeds.

## **FORRU Nursery Day Saturday 27<sup>th</sup> August**

### **Establishment of Research Nursery**

Mr. Kunakorn led a brainstorming session about how to establish a research nursery with participants by exchanging their experiences. Delegates suggested that tissue culture might be used for many species. However, the techniques that FORRU is developing should be practicable by villagers.

### **Germination Trials**

Mr. Cherdsak explained about the nursery process from seed treatments until seeds are germinated and seedlings ready to prick out. Techniques using heat and acid to stimulate the germination were also discussed. The main session was about germination trials, which is very important to test germination percentage and survival for each species. Participants were divided into groups to do their own germination trial check.

## **Potting Seedlings**

The participants were interested how to prick out small seedlings from the germination trays into the plastic bags. This delicate task is important to the root system of the seedlings. They practiced the techniques themselves.

## **Monitoring Seedling Growth**

Monitoring seedling growth is the major task in a research nursery. The seedling growth rate is very important for production scheduling. The saplings should be about 30-40 cm. in height by planting time. The record of seedling growth should be done once a month. Participants practiced data collection for seedling monitoring.

## **Caring for Seedlings in the Nursery**

Nursery care mainly considered the demands that seedlings need to survive and grow vigorously. Main factors discussed were providing water, light and nutrients in adequate amounts and controlling pests and diseases. Grading or quality control and weed control were also demonstrated. As a research nursery, FORRU has tested several techniques such as air-pruning, use of root-trainers, and Osmocote fertilizer application. The participants observed and discussed about techniques in nursery. They are quite interested in pest control.

## **Nurturing Wildings in a Nursery**

Wildings are tree seedlings dug up from the forest. They can generate planting stock faster than germination from seed. Cherdasak demonstrated this technique, which the participants found very interesting.

## **Production Schedules and Analyses of Nursery Data Monday 29<sup>th</sup> August**

### **Analyzing Seed Germination Experiments**

This exercise allowed the participants to analyse the seed germination data that they had collected the day before. Participants practiced using the Excel spreadsheet program to carry out statistical analyses. They were very interested in the analysis exercise and wanted to learn more. It was suggested to add more data analysis exercises to their workshop in Laos.

### **Production Schedule**

Dr Steve ran a PowerPoint presentation on FORRU's work on seed dormancy and germination and production scheduling, which combines data on phenology, germination, and seedling growth to determine how to produce trees of optimum planting size at the optimum planting date. These schedules can help nursery managers plan seed collection and nursery work schedules. The Lao participants were interested to create their own production schedule and they received the FORRU production schedule posters as an example to follow.

## **Field Plot Monitoring at Ban Mae Sa Mai Tuesday 30<sup>th</sup> August**

### **Performance of Planted Trees**

FORRU's standard methods of monitoring planted trees were demonstrated and then the participants were divided into small groups to practice by themselves. They measured growth, health, canopy width, and weed score.

### **Direct Seeding**

Direct seeding was explained by Panitnard in the experimental plot direct seeded for her MSc project. A comparison of seedlings from direct seeded and those planted out from the nursery was made. The results showed that some species can be established by direct seeding better than by tree planting. Direct seeding could be done at much lower cost than tree planting and eliminate nursery costs. The participants were interested in direct seeding, especially methods to deter seed predators.

### **Vegetation Monitoring**

Vegetation monitoring is done to determine biodiversity recovery. Mr. J. F. Maxwell demonstrated the circular sub-plot method for vegetation surveys. All ground flora species under 1 metre tall in the circle are recorded and scored by Braun Blanquette score. Trees both planted and natural are measured for height and diameter. After the initial demo, unfortunately heavy rain occurred before participants could practice with their own sub-plots.

The participants already learn the process and methodology. They found out that the survey is not difficult to do. However, the most difficult part is plant identification. They realized that plant taxonomy is another subject that they need to study more and try to create more experts in plant taxonomy.

## **Planning Analysis and Community Scenario on Friday 24<sup>th</sup> June 2005**

### **Planning & Labor Analysis**

Sudarat presented a PowerPoint show on planning for forest restoration programs, including activity scheduling, time and labour management.

The planning and making action plan on the forest restoration must be correlation with the villagers. Assistance from the outside agencies is also important.

### **Role Play Scenario on Friday 24<sup>th</sup> June 2005**

Mr. Kunakorn facilitated a role play scenario by allowing each participant to play the role of one of the stakeholders in a village forest restoration project. The situation was presented and discussed. Participants were not so familiar with the role play situation and failed to follow their roles and ended up playing themselves rather than pretending to be their assigned roles. Nevertheless, they can come up with the plan for their communities.

## Scenario

There are 2 villages situated along a river running down from the mountain at the elevation of about 1,600 meters from sea level. Village A is located at the upstream at the foot of the mountain (elevation about 700 m), while village B is about 5 km away at the lower elevation of downstream. The population of village A and B are about 500 and 1,000, respectively.

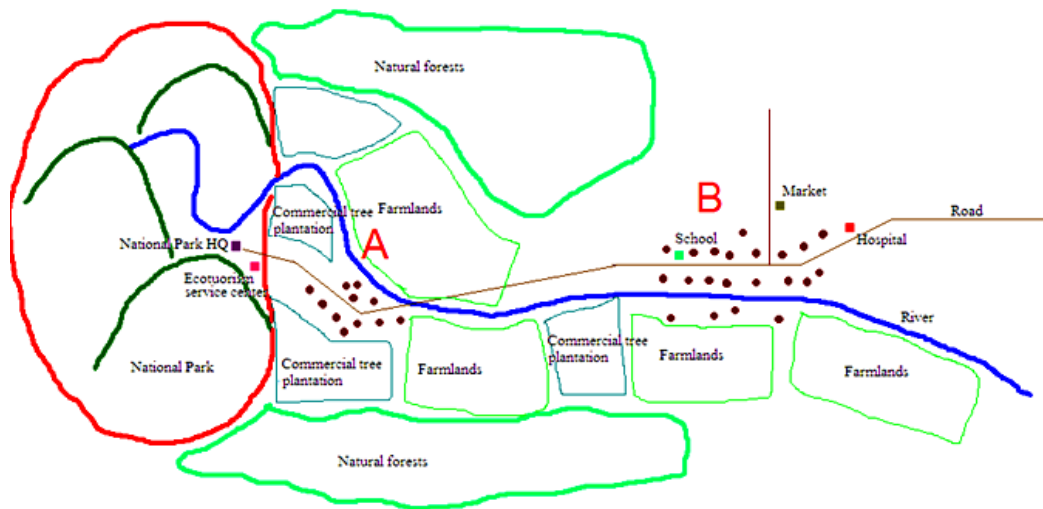
Being at the gate to the National Park covering all water catchments of the mountains around this area, most people in village A are farmers practicing their old way of agriculture. However, due to the outstanding scenery around the village area and also nearby the natural tourism-potential sites in the national park, a trend of tourism related occupation is rising. There is a private tourist service center just operated in the village last year. There is a private sector here running a co-business with government, a company doing tree plantation.

At the downstream site of village B, with more population, there are more resources as small hospital, school, post office, stores, market, local government and non-government organizations and even accommodation like small resort. People here have more variety of occupation including farmer, merchant, teacher, shop owner, governmental officer and private workers. The growing trend of tourism has also benefited this village where the tourists usually get their supplies and service from here.

## Roles

Manager of Company X tree-plantation	Age 45, experienced * want to expand the plantation
Coordinator of Company X tree-plantation	Age 31, energetic, diplomatic * aware that the company want to expand the plantation
National Park Officer 1	Age 50, experienced * aware of the country policy to increase forested area
National Park Officer 2	Age 25, high educated *aware of the country policy to increase forested area
Farmer from village A 1	Age 51, old agriculture practice, local wisdom * facing the problem of low yield and marketing
Farmer from village A 2	Age 45, old agriculture practice, good marketing skill *facing the problem of low yield and marketing
Farmer from village A 3	Age 35, new agriculture practice, educated *facing the problem of low yield and marketing
Head of village A	Age 56, experienced
Tour Guide & owner of service center from village A	Age 32, with some assess, educated * aware of increasing tourism trend
Teacher from village B	Age 40, experienced, educated * want to develop youth & nature curriculum
Head of village B	Age 47, experienced and educated
Owner of goods store from	Age 40, with assess, good business link

village B	* interested in developing tourist service center and resort for accommodation
Owner of handicraft center from village B	Age 30, educated and energetic * want to develop business of local handicraft
Medical doctor from village B	Age 32, educated and energetic *want to develop better local health education
Governmental Agriculture officer from village B	Age 41, educated * running some programs helping farmers to practice more sustainable agriculture
Environmental activist from village B	Age 30, educated and energetic * receive a grant to run a conservation project locally
Professor from the university in the City	Age 38, high educated, linked to head of village B and the environmental activist * interested in running forest restoration and conservation in the area



## Outcome from Role Play activity

### Thoughts from Village A

- area zoning
- economic tree plantation (rubber tree)
- developing a project to help farmers free themselves of debt
- developing optional agriculture practices, a more sustainable way
- conservation rule setting
- working together with village B to improve marketing & trading facilities

### Thoughts from Village B

- limit or control access to natural resources, waste water from upper land, soil erosion from upper land and chemical contamination
- convenient, tourist stop site
- developing herbal garden and medication center

- school, Government forestry department and environmental organization working together in developing environmental education curriculum
- implement a village conservation club like at Ban Mae Sa Mai
- train farmers in sustainable agriculture practices
- improve the local handicraft center
- Government forestry department should work together with communities (both village A and B) to survey for baseline information of natural resources, land use survey and demarcation, enforcement of environmental and forest related laws, area zoning

## **Conclusions**

For both villages, integrated project in the following areas were proposed:-

1. Forest Conservation projects led by the forestry department
2. Sustainable ecotourism development
3. Sustainable agriculture practice development
4. Environmental education
5. Marketing and trading facilities development

## **Field Data Analysis**

Dr. Steve presented a demonstration of field data analysis to calculate the performances of each species, especially the Regressive Growth Rate (RGR) and survival.

## **NTFP – Non Timber Forest Products**

Mr. Kunakorn led a brain-storming session about Non Timber Forest Products (NTFP's) by which participants added products to a "Nature Bank"

Participants were really interested in this session, because they had a chance to show their knowledge and opinions. When implementing the framework species method, the selected species could be those that yield NTFP's desired by the local community. In this way the needs of conservation and the local community can be combined.

## **Final Discussion - How to apply FORRU in Lao PDR?**

The final day of the workshop was devoted to discussion groups. In the morning participants considered how to implement a FORRU in their own country and in the afternoon they discussed how to achieve the remaining outputs of this Darwin project.

## **Group 1 (FRC staff) - Initial thoughts on Establishing FORRU – Laos**

### **1. Where would be located a FORRU?**

- Forestry Research Center(FRC)

### **2. How should be organized/administered?**

- Staffing & Field organization:
  - Leader
  - Staff
  - Field stations:
    - Uplands (bare & good regeneration area)
    - Lowlands (bare & good regeneration area)

### **3. Who should be involved?**

- Gov. organizations: Forest Research Centre, National Agricultural Forest Extension Service, National University of Laos, District Agriculture and Forestry Extension Services
- Villagers( Forest dwellers)

### **4. Which of the concepts that you have learnt about during this workshop would you consider adapting to running a FORRU in Lao?**

- ANR

### **5. Are there any forest restorations concepts that you want to explore that have not been covered in this workshop?**

None

### **6. Which research methods demonstrated in this workshop would you use when running a FORRU?**

- Phenology survey
- Research activities in nursery
  - Seed testing
- Trees planting experiments
  - Tree Planting
  - Direct sowing
- Ground Flora survey and monitoring
- Data recording & analyzing with computer programmes

### **7. What other research techniques would you like to have seen included in the workshop?**

Everything seems to have been covered.

### **8. Can you name any Laotian forest tree species that you think are worth testing as Framework species?**

- 1) *Bishofia* spp.
- 2) *Alstonia* spp.

- 3) *Tetrameles nudiflora*
- 4) *Dipterocarpus* spp.
- 5) *Champapa* spp. (May Sai)
- 6) Tong khop
- 7) Mak kok (May mak mua)
- 8) *Ailanthus* sp (Nhom hom, Nhom hin)
- 9) May ko (*Lithocarpus*, *Quercus*)
- 10) *Ficus* spp.
- 11) Mai ke lao
- 12) Lauraceae: *Litsea*, *Persea*,
- 13) Po hu
- 14) Nhieu pa
- 15) Kok thong
- 16) *Melia* spp.
- 17) *Baccalaurea* spp.
- 18) Mak khen

**9. How might you use the lesson learned during this workshop over the 6 months?**

- Pre-organization for FORRU Lao
- Estimation for field sites, sites selection and agreement with local authority
- Begin drafts of project proposals

**10. What other comments would you like to make about the contents or running of this workshop?**

- We have been completely satisfied with the scope and implementation of the workshop and will learn more when translating the literature.

**Group 2 (University and local forestry staff) - Initial thoughts on Establishing FORRU – Laos**

**1. Where would be located a FORRU?**

1. Santhong District, Faculty of Forestry (FOF), National University of Laos (NUOL) or
2. Phoun Khao Khouay National Biodiversity Conservation Area

**2. How should it be organized/administrated?**

1. National Agriculture and Forestry Institute, Forest Research Centre
2. FOF, NUOL

**3. Who should be involved?**

Forest Research Centre, Faculty of Forestry NUoL, National Biodiversity Conservation Area Staff, concerned local villagers

**4. Which of the concepts that you have learnt about during this workshop would you consider adapting to running a FORRU in Lao?**

1. Framework tree species
2. Planting methods
3. Awareness raising of villagers
4. Some research methods/ seed pretreatment and others

**5. Are there any forest restorations concepts that you want to explore that have not been covered in this workshop?**

1. Tree disease, pests and insects.
2. More on the economical uses of framework tree species and NTFP's.

**6. Which research methods demonstrated in this workshop would you use when running a FORRU?**

All methods and processes done by this seminar are necessary and important in forest restoration in Laos.

**7. What other research techniques would you like to have seen included in the workshop?**

None

**8. Can you name any Laotian forest tree species that you think are worth testing as Framework species?**

1. *Hibiscus* sp(Po Hu)
2. *Macaranga* sp (Mai Thong Khop)
3. *Baccaurea oxycarpa* (Mai Mak Fai)
4. *Macrocos paniculata* ( Mai Mak Khom som)
5. *Ficus* sp (Mai Mak Dua)
6. *Persea* sp (Mai Yang Bong?)
7. *Lepisanthes rubiginosa* (Mai Mak Huat)
8. *Croton* sp (Mai Pau)
9. *Flacourtia rukam* (Mai Mak Khen)
10. *Ficus* sp (Mai Mak Hai)
11. *Melia azedarach* (Mai Kadaoxang)
12. *Bombax ceiba* (Mai Ngeo Paa)
13. *Gmelina arborea* (Mai Xo)
14. *Antidesma* sp (Mai Mak Mao)
15. *Syzygium* sp (Mai MAk Waa)
16. *Pterospermum megalocarpum* (Mai Ham Ao)
17. *Anthocephalus chinensis* (Mai Sako)
18. *Sindora siamensis* (Mai Tae ho)
19. *Hopea odolata* (Mai Kaen hua)
20. *Pterocarpus macrocarpus* (Mai Do)
21. *Dipterocarpus alatus* (Mai Ynang)
22. *Vatica* sp (Mai Si)
23. *Litsea monopetala* (Mai Mee)
24. *Aporosa dioica* (Mai Muat)
25. *Azzeria xylocarpa* (Tae kha)
26. *Tetrameles nudiflora* (Mai Phoung)
27. *Michelia champaca* (Mai Champa paa)
28. *Spondias cytherea* (Mai Mak kok)
29. *Azadirachta indica* (Mai Khom ka dao)
30. *Toona febrifaga* (Mai Ynom Pha)
31. *Chukrasia tabularis* (Mai Ynom hin)
32. *Sandoricum indicum* (Mai Mak tong)
33. *Aquilaria crassna* (Khetsana)

34. *Alstonia scholaris* (Tin Pet)
35. *Casnopsis* sp (Mai Ko)
36. *Fernandoa adenophylla* (Khae Lau)
37. *Erythrina stricta* (Thong)
38. *Zanthoxylum rhetsa* (Mai Mak Khen)

**9. How might you use the lesson learned during this workshop over the 6 months?**

1. Ground survey
2. Tree species baseline survey
3. Location survey
4. Seed collection and nursery construction planning

**10. What other comments would you like to make about the contents or running of this workshop?**

1. Increase duration of data analysis exercises.
2. Process of discussion with villagers to exchange the knowledge
3. Wildlife survey techniques
4. Manuals concerning forest restoration research should be supplied (*This will be one of the outputs of this project and translated into Lao - Ed*).

In the afternoon all participants worked together to start to plan the other outputs of this project, including hosting their own workshop in Laos and production of training materials in their own language. Their conclusions are summarized below:



## **AGENDA OF THE WORKSHOP IN LAO PDR**

**Title: “Forest Restoration in Lao PDR”**

**Objectives:**

- To formulate a comprehensive integrated FORRU plan for Lao PDR.
- To write up a proposal to establish the Forest Restoration and Research Project (FORRP) in Lao PDR.

**Major Content:**

Issues to be addressed by workshop:

- Overview of forestry situation in Laos.
- Forest rehabilitation in the past.
- Research work of FRC.
- Role of FORRU in forest restoration
- The need to have FORRU in Laos
- FORRU project design in Laos

**Venue:** for workshop and field trip

- Forest Research Centre (NAFRI) and Faculty of Forestry (NUoL)
- Sangthong district or Phou Khao Khouay National Biodiversity Conservation Area

**Organizing Committee:**

Forest Research Centre, FORRU, and Faculty of Forestry

**Participants:**

IUCN, NAFRI, Faculty of Forestry, World Wildlife Fund, FRC, Department of Forestry, STEA, SNV, Darwin (Laos), NAFES, FORRU (Thailand), SIDA, IDRC, WCS

**Duration:** In July 2006, Five days (tentative)

- First day open for general agenda
- Other days closed sessions (round table discussions) for proposal write-up

**Expected Outputs:**





- The proposal and integrated FORRU plan for Lao PDR.
- Publications;
  - Fieldguide – “How to Plant a Forest.” – draft in Laotian for comments.
  - Manual – “How to establish Forest Restoration and Research Project”  
Both of them will be translated and adapted to Lao version.

**Translators for Lao versions of the literature**

1. Sounthone Ketphane (FRC)
2. Souksompong PRIXAR

EVALUATION REPORT

Please fill in the form how you satisfy about each section of the workshop.

Workshop Program – หัวข้ออบรม	Satisfaction score – คะแนนความพอใจ			
				
24/8/05 – Objectives of the workshop. Introduction to FORRU and the framework species method, Why are FORRUs needed?	10	5		
25/8/05 – Framework species plots - what can be achieved	9	6		
25/8/05 – Community motivation for forest restoration - BMSM	5	9	1	
26/8/05 - Phenology and seed collection in natural forest	10	5		
26/8/05 – Herbarium Visit, Phenology data analysis and genetic considerations of seed collection	4	10	1	
27/8/05 – Nursery techniques	11	4		
29/8/05 – Analysing seed experiments, Dormancy, Production Schedule	7	8		
30/8/05 – Monitoring tree performance, Weeding/fertilizer performance	8	6	1	
30/8/05 – Vegetation monitoring - field work, Direct seeding..	3	10	2	
31/8/05 – Planning - time, labour and costs, Role Play Scenario	5	10		
01/9/05 – Analysing field data, NTFPs, Selecting Framework Species	8	7		
02/9/05 – Final discussion - planning exercise	7	7	1	

# Any subject do you think FORRU should provide more information? Why?

- Wildlife survey, soil survey, pest & disease study, seed pretreatment and storage, more data analysis

# Which subject do you think FORRU should cut from the program? Why?

None

# Comments and Suggestion?

- Need more time and details for data analyses sessions in all process, both germination and seedling performance.