"PRINCIPLES AND PRACTICES FOR FOREST RESTORATION: ESTABLISHMENT AND MANAGEMENT OF A FOREST RESTORATION RESEARCH UNIT IN CAMBODIA"
9 – 13 OCTOBER 2006,
FORESTRY ADMINISTRATION (FA), DEPARTMENT OF FORESTRY,
MINISTRY OF AGRICULTURE, PHNOM PENH, CAMBODIA

SPONSORED BY DARWIN INITIATIVE, U.K.

Title	**"Principle and Practice for Forest Restoration: Establishment and Management of a Forest Restoration Research Unit in Cambodia"**
Date:	9 – 13 October 2006
Venue:	Forestry Administration (FA), Department of Forestry, Kampong Thom Cantonment and Siem Reap Cantonment
Language:	English, and Khmer
Sponsored by:	**UK** Darwin Initiative
Organised by:	Forestry Administration (FA), Department of Forestry**,** Cambodia
Joint Organisation:	The Forest Restoration Research Unit (FORRU-CMU)

Introduction

In November 2005, the "Principles and Practice of Forest Restoration Workshop for Cambodian Group" was the 3rd of three workshops hosted in Chiang Mai, Thailand by FORRU-CMU. The workshop 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 the workshop in Cambodia, ii) input into Forest Restoration and Research Project Establishment Manual and iii) adaptation and translation of "How to Plant a Forest" were discussed.

The follow-up workshop in Cambodia was held on 9 – 13 of October 2006. The Forest Administration (FA) under the Department of Forestry, Ministry of Agriculture (MA) organised the workshop. Thirty participants attended the workshop, including 3 staff of FORRU-CMU.

Objectives

1) To formulate a comprehensive integrated FORRU plan for Cambodia.
2) To write up a proposal to establish a Forest Restoration and Research Project (FORRU) in Cambodia.
3) Review and discuss project publications
    - Field guide – **"How to Plant a Forest"** – drafted in Khmer for comments.
    - Manual – **"Research for restoring tropical forest ecosystems: a practical guide"**

Participants

1)	Mr. So Thea	CTSP Project manager, FA
2)	Mr. Long Bong	CTSP (Coastal Zone), FA
3)	Mr. Chaai Saran	Chief of Kho Kong Cantonment, FA
4)	Mr. Saut On	Community Forestry, FA
5)	Ms. Sou Hai	Chief of Siem Reap Cantonment, FA
6)	Mr. Chhang Phurin	Chief of Kampong Thom Cantonment, FA
7)	Mr. Chea Phally	Cheif of Sandan Division, FA
8)	Mr. Meas Sophon	Siem Reap Cantonment, FA
9)	Mr. So Phalla	Chief of Royal Concession of Cambodia
10)	Mr. Ket Nang	CTSP (Natural Forest Restoration)
11)	Mr. Heng Kamich	FA
12)	Mr. Ching Hong Narith	CIS, FA
13)	Mr. Taeng Sokhom	Director of FA
14)	Mr. Chan Rachata	Chief of Forestry Department
15)	Mr. Eng Polo	CIS, FA
16)	Representative from	Royal University of Agriculture
17)	Representative from	Prek Leap National School of Agriculture
18)	Mr. Siem Prum	Mlub Baitang (NGO)
19)	Mr. Uk Sameth	Phnom Neang Kang Rei (NGO)
20)	Mr. Koaik Thocnh	Phnom Neang Kang Rei (NGO)
21)	Rrepresentative from	Wildaid
22)	Representative from	WWF
23)	Mr. Khen Chan Virak	British American Tobacco (private)
24)	Mr. Sounthone Ketphanh	FRC, Lao PDR
25)	Mr. Somphachanh Vongphasouvanh	FRC, Lao PDR
26)	Mr. Sen Sambo	GERES (NGO)
27)	Mr. Arnoud Guidal	GERES (NGO)
28)	Dr. Stephen Elliott	FORRU-CMU, Thailand
29)	Ms. Sudarat Sangkum	FORRU-CMU, Thailand
30)	Ms. Alissa Hattersley	FORRU-CMU, Thailand

PROGRAM

DATE/TIME		SESSION/ACTIVITY	FACILITATOR
08.10.06		ARRIVAL OF PARTICIPANTS FROM LAOS AND THAILAND	
09.10.06	08:30	OPENING SPEECH	HEAD/VICE HEAD FA
	08:45	OBJECTIVES OF THE WORKSHOP	MR SO THEA
	09:00	PRESENT SITUATION OF FOREST COVER AND THE NEED FOR FOREST RESTORATION	MR TEANG SOKHOM
	09:30	EXISTING POLICIES AND LEGISLATION RELATED TO REFORESTATION	MR TEANG SOKHOM
	10:00	BREAK	MRS KIM SOPHY
	10:30	EXPERIENCE IN FOREST RESTORATION (FORESTRY ADMINISTRATION)	MR CHAI SARANN
	11:15	EXPERIENCE IN FOREST RESTORATION (GERES, FRENCH NGO)	MR ARNAUD GUIDAL
	11:30	WHY ARE FORRUS NEEDED, FORRUS IN OTHER COUNTRIES	DR STEVE
	12:00	LUNCH	MR KET NANG
	13:30	SOURCES OF REGENERATION AND ANR	MS SUDARAT
	14:30	BREAK	MRS KIM SOPHY
	15:00	FRAMEWORK SPECIES METHOD	DR STEVE
	15:40	EXPLAIN HOW TO PLANT A FOREST, HAND OUT DRAFT COPIES	MR SO THEA
	16:30	ANNOUNCEMENT FOR DAY 2 PROGRAM	
10.10.06	08:00	**ESTABLISHMENT OF FORRU IN CAMBODIA:** AIM/OBJECTIVE, BASIC CONCEPTS ETC EXISTING FACILITIES (OFFICE, NURSERY, SITE FOR FIELD WORK, HERBARIA)	MR SO THEA/ DR STEVE
	10:00	BREAK	MRS KIM SOPHY
	10:30	CONTINUE WITH ABOVE	MR SO THEA
	12:00	LUNCH	MR KET NANG
	13:30	CONTINUE WITH ABOVE	MR SO THEA
	14:30	BREAK	MRS KIM SOPHY
	15:00	RESULTS FROM LAOS WORKSHOP (FORRU PLAN AND ADOPTION OF 'HOW TO PLANT A FOREST')	MR SUNTHONE KETPHANH
	16:30	ANNOUNCEMENT FOR DAY 3	MR SO THEA
11.10.06	07:00	DEPARTURE TO KAMPONG THOM	MR KET NANG
	10:30	MEETING WITH VICE HEAD OF KAMPONG THOM CANTONMENT	
	10:50	NORTH TONLE SAP INSPECTORATE HEADQUARTER	
	11:30	BUDDHISM FOR DEVELOPMENT KAMPONG THOM (BFDK)	
	12:00	CHECK IN HOTEL + LUNCH	
	13:30	COMMUNITY FORESTS (BFDK)	
	16:30	RETURN TO KG THOM	
12.10.06	07:00	BREAKFAST + PACK LUNCH INDIVIDUALLY	
	07:30	DEPARTURE TO PRASAT SAMBO	
	08:45	PRASAT SAMBO (FOREST AND NURSERY)	
	09:30	COMMUNITY FOREST (MLUB BAITANG)	
	12:00	LUNCH IN PRASAT SAMBO	
	13:00	BACK TO PHNOM PENH	

13.10.06	08:00	**ESTABLISHMENT OF A FORRU IN CAMBODIA:** ORGANIZATION, LOCATION, METHODOLOGY, BUDGET, STAFFING AND TRAINING REQUIREMENTS.	MR SO THEA
	10:00	COFFEE BREAK	MRS KIM SOPHY
	10:30	DISCUSSION ON ESTABLISHMENT AND MANAGEMENT OF A FOREST RESTORATION RESEARCH UNIT IN CAMBODIA	MR SO THEA
	12:00	LUNCH	MR KET NANG
	13:30	FINAL SESSION TO RECEIVE COMMENTS ON HOW TO PLANT A FOREST-ARRANGE EDITING, REVIEWING, AND SET DATE FOR PRINTING	MR SO THEA
	16:30	CLOSING	MR SO THEA/DR STEVE
14.10.06		DEPARTURE OF LAOS AND THAI PARTICIPANTS	

LANGUAGE: KHMER AND ENGLISH

ABBREVIATION:
ANR : ASSISTED/ACCELERATED NATURAL REGENERATION
FORRU : FOREST RESTORATION RESEARCH UNIT

REPORT ON EVENTS

Welcome Remarks and Introduction on Monday 9th October 2006

Openning Speech – H. E. Ty Sokhun, Head of Forestry Administration
Mr. Sokhum welcomed all participants, especially Dr. Steve and his staff from FORRU, Thailand. He reported briefly on Cambodia's strategies in forest management. As the FA has major responsibilities for forest conservation, it is actively involved in and has encouraged tree planting and forests and wildlife conservation activities. Mr Sokhum also believed that the results of the workshop could be useful for the National Forest Policy Program for the Royal Government of Cambodia.

Objectives of the Workshop – Mr. So Thea
Mr. So Thea introduced the aims of the workshop, and also described why a Forest Restoration Research Unit is needed in Cambodia. He presented the organizations involved such as FORRU –CMU, EMR and the Darwin Initiative, U.K. The results from workshop in Chiang Mai were also mentioned and the possibilities to establish a FORRU in Cambodia. Moreover, stakeholders were invited to contribute to the Cambodian version of **"How to plant a forest".**

Present situation of Cambodian Forests and the need for forest restoration – Teang Sokhom Dept. of Watershed and Woodland
Mr. Sokhom described the major reduction in Cambodian forests since 1992.Year 1992 – 1996, the forest restoration started with GTZ project. However, the study process was very hard to implement and record data because of the civil war. After that, the JAFTA also applied the reforestation in 1999 – 2002.

Discussion
Question: Dr. Steve: I would like to ask about the situation with evergreen forest, is there any highland forest (>1000 m)? Why has the evergreen forest been cut down so fast (32,000 ha lost)?
Answer: The large areas of evergreen forest that was destroyed are from forest land encroachment for agriculture, especially near the Vietnam border, also the rubber plantation. Other areas in Siem Reap have been converted for tourism.

Existing Policies and Legislation Related to Reforestation in Cambodia – Teang Sokhom
Mr. Sokhom explained about the National Policy that focused on sustainability and protection; with strategies from the Royal Government of Cambodia (RGC) to enhance agriculture sectors, land reform, and mine-clearing. He also reported that the millennium development goal to year 2015 is 60% forest cover. Not only the land reform and classification, but also socio economic developments are being concerned. Regulations and Laws have been passed to promote forest restoration by allowing people to plant trees and sell NTFP's, and also to get rewards or praise from the government. FA also supports education and extension work for local communities and people. Planting trees is an activity which is as memorable as wedding or birthday ceremonies!

Discussion

Question: Dr. Steve: Does FA manage all forests, with the exception of inundated forest and protected areas? The Community Forest (CF) is in a protected area. How the Forest Community (FC) do protection exclude of community needs? It's no clear management plan for Community Forest, and not enough patrols.

Answer: FC promotes halting illegal logging, encourages more patrolling, forest restoration and allows only to be collected.

Answer: Protected areas mainly focus on conservation and protection, so the FC can establish NPs, but mainly they focus on conservation, allowed by the decree. Forestry law promotes CF as part of production forestry.

Answer: Article 71 declared that forest can be restored to public land or state property with plantations, but could not be given a grant; no claim for anyone, except. agro-industry plantation eg. cassava, sugar cane. Sometimes forest land is distorted to agro-industry to avoid the law that prevents farmers from owning the land rights. More than 11 millions ha have been lost by land grabbing. If it's possible we could discuss in this in the present workshop and draft a regulation for implementation to protect people's land claims when land use changes from forest to agriculture.

Experience in Forest restoration (FA) – Mr. Chay Saran from Kho Kong Province (proposed FORRU Site at Russeichrum Commune, Thmarbang district**)**

Mr. Saran presented his forest restoration site. He had already applied the FWSP techniques in his area in Kho Kong Province near Trat, Thailand. The area has some rain forest with some Eucalypts, teak, Aquilaria crassna, and some monocrops. This site works closely with many organizations from other countries.

Discussion

Question: **Dr. Steve:** What species have been planted there?

Answer: Mostly *Afzelia xylocarpa*, *Pterocarpus macrocarpus*, *Dipterocarpus* spp., and *Macaranga* spp. The Russechrum Commune has low encroachment, and has been secured by NGOs in the community with stone boundary.

Question: What are the planting activities?

Answer: The project received a plan from CI and WILDAID providing land for planting, so they asked the project to plant the area. They searched for people who can do seedling protection and want to plant trees.

Question: I saw you applied the Framework species techniques. Are the seed available for planting yet?

Answer: The area has fruits of FWSP nearby.

Question: The CI and WILDAID want to plant trees for conservation? Or FA?

Answer: WILDAID and CI works under law enforcement, WILDAID will not work in the area, if it already in has forest cover.

Question: What is the law regarding collection of seeds from forest for community forestry?

Answer: It is not allowed officially but happens in practice. The committee discussed which species to collect, and the quantities.

Question: Does FA recommend local people to plant *Aquilaria crassna*?
Answer: The law does not allow villagers to collect seedling from protected forest. FA provides techniques to plant *A. crassna*. However, CF regulates how to collect sustainably. This afternoon we will discuss more about sustainable seedling collection.

Experiences in forest restoration (GERES, French NGO) – Mr. Arnound Guidal
Mr. Guidal presented a project to preserve the environment and improve livelihoods through efficient energy and fuel wood use. The activities involve improved cooking stoves to conserve charcoal, promotion of biofuel, and cooperation with the Ministry of Environment to plan a wood energy policy. He also presented other alternative energies and discussed managing wood energy as carbon credits.

Discussion
Question: Do you apply any solar cooking techniques?
Answer: We did not focus on hi-tech equipment; we want to apply something that is local and cheap to use here. Solar cooking is difficult to adopt, and cooking with wood produces special rice with a unique smell.

Question: How about agro-forestry?
Answer: we supported a few families to plant trees in their rice fields, mostly nitrogen fixing species, eg. *Azadirachta* sp., *Acacia* sp, and cashew nuts (whose leaves can be used to feed cattle).

Question How are seedlings in rice fields protected from cattle?
Answer: When rice is growing, cattle are in the forest.

Question How are carbon credits calculated?
Answer: We use methodology approved by the EU.

Why are FORRU's needed – Dr. Stephen Elliot, FORRU-CMU
Dr. Steve described the work of FORRU-CMU and lessons learned from other countries. He described the framework species method, its origins in Australia, and how the method was adapted to the ecological and socio-economic conditions of northern Thailand. The present project, supported by the Darwin Initiative, U.K. aims to help forestry organizations in Laos, Cambodia and China establish their own versions of FORRU, based on the Chiang Mai model. The manual entitled '**How to Plant a Forest'** is currently being translated into Laos, Chinese, Khmer. A Thai version is complete, and the book is also being translated into Vietnamese.

Source of regeneration and ANR – Ms. Sudarat Sangkum, FORRU-CMU
Ms. Sudarat explained how to apply ANR techniques for forest restoration. The silviculture techniques she described can be used by local communities in Cambodia. The participants were interested in mulching techniques that are often neglected.

Framework Species Method – Dr. Stephen Elliot, FORRU-CMU
Dr. Steve explained how FWSP technique can be applied. Typically, 20-30 native framework tree species are planted for forest restoration. Within 2-3 years, canopy begins to close and the first species start to bear fruits which attract animal seed dispersers. Within the 5 – 6 years new species of trees can be found in the framework forests, and biodiversity begins to recover.

Discussion about the manual "How to plant a forest" – Khmer version – Mr. So Thea
Mr. So Thea explained the book content and asked the participants to read and provide comments on Friday 13th. The content will be adapted to cover Cambodian forest types and local conditions; also the species selection part will be modified to include Cambodian species.

Each chapter was discussed in relation to conditions in Cambodia. Mr So Thea welcomed comments from participants, which would serve as part of the review process for the book.

Dr. Steve also told participants that the book has no copyright to transfer or give to people. It is more than a translation of the Thai version, as it is being adapted to fit Cambodia conditions. The logos of sponsors can be added by your organization logos for more collaboration. The terminology can be adapted for each language. Technical terms and scientific names are the main problem for Thai and Laos version as well. The book will provide a glossary, index, and references.

Discussion
Question: Mr. Kamich: Can the FWSP method be used in lowland areas with local communities, as well as in evergreen forest in protected areas?
Answer: Dr. Steve: The FWSP method can be applied in both situations, although the results will be quite different. Totally degraded lowland areas will take much more effort to restore and a very much longer time will be needed for any sort of recovery, and also biodiversity may not be rich. In our experience, seed dispersers such as small mammals and bats can transport seeds over up to 10 km, so if there is no forest nearby, recruit species may be sparse and most of the trees will be planted ones.

Establishment of FORRU in Cambodia on Tuesday 10th October 2006

Project Planning and Proposal Draft for the Establishment of a FORRU in Cambodia

Mr. So Thea reported to participants again that one of the aims of the workshop is to draft an implementation plan for the establishment of a FORRU in Cambodia

Discussion
Question: Is this a local or national initiative?
Answer: First it can be a local project, then it can be expanded to the national level. It may need 4 -5 research institutes to be involved.

Question: Mr. Wann Sopana, director of Northern Tonle Sap Inspectorate would like to put this project in Siem Reap. Thom. Tonle Sap is quite broad area, so we should define a more local area. Have we already selected an area for experimental plots?
Answer: We have not yet decided about the site but a possible research site is in Kampong Thom, because it is in northern Tonle Sap and this is easy to access from other parts of the country. The FORRU will not only undertake research but will also carry out education and extension; Kampong Thom is in the centre of Cambodia and hence more collaboration should happen.

Dr. Steve: You need to focus on the actual forest ecosystems and the research required to restore the forests, not just the location of office or plot size.

Mr. Saran: Should we have 2 sites for experimental plots and compare them?
Dr. Steve: Doi Suthep-Pui National Park has 2 forest types – evergreen and deciduous forests, but we have only one unit working in the evergreen forest because this has more biodiversity. However, we can do research in deciduous forest as well. Normally, the funding agency will support the one project aim and then see how the results can be applied to support other areas.
Mr. On: I agree with Dr. Steve, the forest ecosystem in 2 areas may be quite different, so we should make different projects and choose one first (maybe Kampong Thom).

Mr. Saran: I want to do research like FORRU, so research should be done carefully. Could we prepare 2 proposals and choose the best one, or do both in 2 different forest types?
Dr. Steve: You can propose the project for training both groups together, by sending people for training about FORRU techniques at the main center, then can send them back to the research site in different area, or do it step by step: work in one area and then apply the results to others.

Dr. Steve: Which one has more diversity and more important forest type here?
Mr. Thea: The forest ecosystems of the coastal zone have higher biodiversity. On the other hand, Kampong Thom has deciduous forest but high pressure and threats to forest.
Mr. Saran: The 2 ecotones are different and FWSP are different as well.

Question: Do FWSP include economic trees or not?
Answer: FWSP is for biodiversity not mainly focusing on economic tree species.

Question: Should we study more about FWSP species first, and then we can identify FWSP by ourselves?
Dr. Steve: To education and extension and strengthen staff should be in objectives. Training need to be applied for staff first, they have to do the job and get experiences, then can share to others eg. local and guest visits. We should put more specific in objectives about staff capacity building and training. Problems that we have here are less biodiversity, reduce forest cover and monoculture tree planting, so we should restore original forest ecosystem. Deficiencies of knowledge are another issue, the training needed is how to understand forest ecosystem and apply the effective techniques.

Dr. Steve: How many tree species are there in the forest?
Mr. Saran: Preliminary studies of coastal forest suggest 300+ species.
Dr. Steve: FORRU took 4 – 5 years to germinate 300 spp. for germination trials. So it will take 2 – 3 years for you to study about 150 spp.

Dr. Steve: How complete is the inventory of trees in your 2 forest types?
Answer: Not all tree species are known or listed and some still need scientific names.
Dr. Steve: You need to collaborate with a plant taxonomist, as we need to know the species in the area first, and we need to survey the forest to investigate tree species diversity before we can copy the nature or make the forest. Furthermore, forest restoration can help to support community forest. Funding agencies will want to know that this field is under some projects that already going on or not, they want to see this whether this project is unique and original.

Mr. Thea: Is it possible to start in 2007?
Dr. Steve: Normally a proposal takes about a year to consider; Darwin for example invites preproposals in October, and if your project approved, it can start in the following April. But we must consider other funding agencies in addition to the UK Darwin Initiative. A good website about funding agencies is www.fao.org/forestry/cpf-sourcebook

Dr. Steve: We can add other details later. However, some activities can start now such as the tree list inventory and site survey. Do you have any herbarium facilities here?
Answer: We collect some specimens but no tools for processing specimens, the specimens are collected in FA for each research project, but we have no proper herbarium.
Dr. Steve: You could plan to store specimens for all the country in the national herbarium or have a project herbarium to collect specimen for this project.

Question: How about a university herbarium?
Answer: FORRU-CMU cooperates closely with Chiang Mai University. But FA has no co-operative with University.

Dr. Steve: FA should collaborate with a University for tree identification and also herbarium facilities. Could we visit the University later?
Mr. Thea: Now we have only one botanist in Cambodia, who is from The Netherlands. We are lacking professional botanists here.
Dr. Steve: We can invite Mr. Maxwell to train your staff in tree taxonomy, identification, and herbarium management. Training with Max would take 2-3 weeks in Chiang Mai for herbarium specimens and techniques, and could include a study of FORRU nursery establishment which will be invaluable for setting a FORRU in Cambodia.

Dr. Steve: Where is the best place for herbarium specimens?
Mr. Thea: We can allocate space for a herbarium at the project office in our new building.

Mr. Thea: For personnel, we can follow FA levels of management; the standard methodologies normally are available for each research topic. Please be aware of the time frame and match with the time of nursery construction, training, time to produce seedlings that could take 2 years to set up everything and get ready on the ground for monitoring. We need to be aware of work task priorities. We should sum up main group tasks together.

Dr. Steve: What is the best time for planting trees?
Answer: We normally plant early in the rainy season in July.

Dr. Steve: Do you need fire prevention?
Answer: It is not necessary here.

Dr. Steve: How about the demarcation?
Answer: We will demarcate the main plots and sub-plots.

Question: How about education and extension?
Dr. Steve: You can do that after the project has a fully operational nursery

Question: Is it suitable for 5 year project?
Dr. Steve: For a 5 year project, it's hard to get funding. So it may start as a 3 year project, or a longer project divided into two or more phases.

Results from Laos Workshop (FORRU Plan and adoption of the How to Plant A Forest Manual) - Mr. Sounthone Ketphanh
Mr. Ketphanh presented the results from his FORRU workshop in Laos held in July. He reported that the proposal is in progress and also shared with participant's information on FWSP lists. The participants were interested in NTFP's ideas and also how to manage them within FWSP plots.

Discussion
Question: I heard you mentioned a lot about NTFP's could you give more examples?
Answer: The major NTFP providing a lot of income is Sassafras oil, extracted from roots and stems of Yang Bong (*Persia umbelliflora*). A lot of use for food and NTFPS in planted plots, so people can get benefits from the plot and save it. This is better than take it from the forest and we can also encourage people to take care the forest as the plant stocks.
Dr. Steve: FWSP can be adapted to local conditions and can be mixed in with NTFP's; may also be potential FWSP species. However, these species still need to be tested for their performance as true framework species

Mr. On: Do you have problems about shifting cultivation? Are there any strategies in Laos to stop this?
Mr. Ketphanh: We aim to stop shifting cultivation in Laos by 2010. So the district office will have to work hard to accomplish this!

Mr. Saran: I would like to ask about the initiative in planting *Aquilaria crassna*. When do you plant and how is it harvested; also how much consumption do you get? Is it only aloe wood that can sell?
Mr. Ketphanh: In Laos we have about 5000 ha for aloe wood as a local garden, and tree companies are now more interested in kritsana than eucalypts and rubber. They are considering oil as well. We still have questions about of the varieties of aloe wood. People thought they can plant this tree and can get a big profit. However, this is not guaranteed!

After that the Vice Head of Reforestation Office also described environmental laws and decrees.

Mr. Thea explained to participants about 2 days trip on 11 – 12 October, to see possible planting and research sites.

Fieldtrip to Kampong Thom Cantonment, Tonle Sap Inspectorate (Km Thom) on Wednesday 11th October 2006

We departed early morning and traveled for about 3 hours. The places visited are listed below. The number in each photo refers to the number of the place visited.

1. **Kampong Thom Nursery**
   This nursery was supported by Prime Minister Hunsen at north Tonle Sap. Most trees are fruit trees, and the seedlings were distributed for villagers for free e.g. mango, coconut, *Delonix regia.* Species presented included both climax and pioneer species.

2. **Km Thom Cantonment Office**
   We went to see Mr. Thep, vice Head of Forestry Cantonment in Km Thom. He explained to us about forest status of Km Thom and also forest conservation activities. This cantonment contains 3 division and 9 triages, the main concern for this cantonment is forest management and tree planting. The forest cover is 52% = 646 ha which includes evergreen/ dry evergreen/woodland forest. The forest restoration policy and works are guided from Central Cambodia.
   The whole cantonment has 3 nurseries in 11 sites; 2 large 1 small scale; and 3 seed sources from nearby forest. The villagers or other stakeholders comprise 61 communities. Activities are supported by 6 international and local NGOs to occupy area 50,000 ha. However, species planted were still limited.
   State land has no particular activities but has Arbor Day to plant trees with planting ceremony at "Phrasat Sambo" ancient temple by planting 1,000 ha, but mostly planted economic species e.g. fast growing acacia and eucalyptus. Small scale village planting can cover 15 – 18 ha, and totaled 100 ha in 2 districts.

   Discussion
   Question: Do you have problems with forest lost?
   Answer: The situation now is that forest is threatened by agro-forestry concessions. The Government gave permission for concessions, turning forest to agro-forestry with rubber tree, eucalypt, and monocrops. That led to illegal logging, land encroachment (80%), population increase, improper management, real estate business. The investors persuaded villagers to clear the forest, and then claimed that the land was degraded, so villagers could then sell the land to these investors.

   Question: Do you have problems with hill tribe's shifting cultivation?
   Answer: Cambodia also has hill tribes, who apply shifting cultivation but not so many of them. Mostly they are in the northern part of the country. The main problem is illegal land selling. Now the government tried to take back some degraded areas that sold/bought illegally. They already took 1,000 ha back.

   Question: How about native species? Are there any planting areas?
   Answer: Local people also planted native species, but they prefer acacia. The big scale for investors will plant fast growing trees like acacia. For small scale in villages, the area is normally 1 ha.

Question: Have you considered restoring some areas for biodiversity?
Answer: We want to assist the 3 divisions to restore forest but need to provide good management plans, which must be submitted to a higher national level before they can be enforced. Mr. Phally the head of division already did some forest protection and applied ANR techniques. In some heavily logged areas, they need to do enrichment planting with native species and NTFP's for both ecological and economical benefits. The gap size is about 2 -5 ha.

Question: Has any work been done on the flora of this area?
Answer: No, but we have 2 seed sources or forest that can be surveyed

3. **North Tonle Sap Inspectorate Headquarter**
   This office can be use to establish a FORRU research nursery. They already have office space for FORRU office and space to construct a nursery

4. **Buddhism for Development of Km Thom (BFDK)**
   This project is a local NGO registered in 2000, which works at the local community forestry level. The main objective of the project is to establish community forests in local villages. The BFDK is an important partner for other organizations in Cambodia. One problem for community forestry (CF) is an institutional issue, because there is no law to support the CF yet, so now they follow the constitution until the CF law sub decree is activated. The forest type is mainly dry deciduous with some evergreen forest.
   The BFDK works closely with FA and sent some staff for training there, e.g. capacity building for CF. They also have some contacts with other CF internationally such as in Nepal, to remedy the forest damage and forest loss. Now they have 21 CF involved with the project.
   The financial support for the project came from many organizations and donations but none permanent. They encourage people to plant trees on their land by supporting them a concrete pole for the villagers who involves in the program. A major concern is environmental protection.
   The activities were based on financial status, e.g. short term funding can organize the trainings or activities that involve tree planting. They still have limitations in knowledge and budgets to run the activities, and need more teaching expertise.

Discussion
Question: Where do the seeds come from?
Answer: Seeds are from CF and a local nursery in the temple, and include *Hopea* sp., *Dipterocarpus alatus*, *Dipterocarpus turbinatus*, *Ficus* sp. and other local species.

Question: Where is the nursery?
Answer: The nursery is about 10 km from the center and each CF has its own nursery. The chairman was a monk before and since that time he organized the nursery in each community. Some were destroyed, now only one remains under his management. The other nurseries are in each CF.

Question: What are the benefits of CF to villagers?
Answer: Villagers can collect NTFP's e.g. wild potatoes and fruits.

Question: Do they allow cutting trees and how are benefits managed and shared?

Answer: Each community has their own regulations, administered the community committee

Question: How are CFs are protected?
Answer: The CF have their own regulations and guards to protect each boundary. The guards are allowed to sell any illegal stuff confiscated from intruders, and share the proceeds amongst themselves. They also have saving fund. They have sense of belonging as to protect their own forest.

Question: What happened to the planted area claimed back from investors?
Answer: In 2001, we reported the conflicts with investors to higher level, the Ministry of Agriculture sent people to investigate and it was realized that the area is important as a watershed forest. So they tried to take the area back and gave to local community to manage in 2002. The total area now is 9,000 ha.

Dr. Steve also gave the website address of funding agencies to BFDK for more funding supports.

5. **Tree planting site in Km Thom**
   This site is near a forest reserve and required an oxcart for 3 km to reach it. The area has flooding problems. The species planted included *Dipterocarpus* spp. and 20-30 other lowland species. The area has quite good recovery. The cattle can be seen in some areas. FORRU-CMU are now working on lowland techniques, although data is are still be collected. We may need to find other area that needs more restoration for biodiversity purpose.

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Fieldtrip to Prasat Sambo Prei Kuk on Thursday 12th October 2006

The next day we traveled to another site in Kampong Thom. The road was a dirt track and had flooded in some areas.

6. **Sambor Prei Kuk Monument – Mr. Samnan, Chief of community**
   This historic temple compound for worshiping the Siva goddess was established; it is called Sambor Prei Kuk Conservation and Development Community. This community has 7 villages, involves about 600 members.
   This tourist site has handicrafts, mostly rattans for sales. They collect rattans from community forests and may plant rattans in the future. They have a committee to control the harvest of bamboo and rattan. They collect mushrooms, fruits, and firewood (not for commercials) for NTFP's. Forest area here is about 25km^2 or 2,500 ha. They have planted trees on Arbor Day for 3 years already.
   GTZ from Germany funded this community for some basic infrastructure for conservation and development community and they got other funding from other NGOs that partnered Wassada University. Sometimes they join workshops or fairs to promote and sell products outside Sambo, such as Phnom Penh. Their products are also distributed to Thailand through a collaboration with Wassada University.

7. **Thanal Con Slue Triage – Nursery of Forestry Office**
   We also went to see the nursery of the triage which has mostly *Sindora cochinchinensis* seedlings. The nursery is quite big and can function as both a research nursery and local community nursery as well.

8. **Jhumma village – Ms. Sinthol, Chief of Phreah Sophea Community Forest**
   Before lunch we went to talk with villagers from Jhumma village. Ms. Sinthol, the chief of CF welcomed us and told us about the situation of this CF. This village established and has managed a community forest for 2 years. There are 152 families with 325 ha of forest area. Most of NTFP's are vines, rattans, fruits, herbs, and mushrooms. Wild animals are decreasing and elephant was extirpated in 1979. The animals still found inlcude: mouse deer, wild boar, barking deer, macaque, rabbit, civet, wild dog, and fox. The major activities here are demarcation, and patrol (about 3km^2). Fortunately they don't have a fire problem, however, cattle are present.

   Discussions:
   Dr. Steve: Do you think that cattle can destroy the regeneration growth rate?
   Answer: We have tried to control cattle, not let them get into reforestation area.

   Question: How is firewood collected?
   Answer: We collect firewood outside the community forest; if we need to collect woods inside the protected forest for building house, we need to ask the committee.

   Question: How are NTFP's collected?
   Answer: The NTFP's are collected in rotation from 3 patches in forest each year.

   Question: Do you think you need to plant more trees, and if so, which species?
   Answer: We need to plant more traditional and medicinal plants. Only the medicine man knows how and which species to collect.

Question: Do they still have illegal logging or land clearing?
Answer: If someone logged or opened the area, we will report it to Forestry Association. Forest clearing in the community forest has to be negotiated with the state forest.

Question: Do they have a lot of bamboo in forest?
Answer: We don't have so many bamboo here.

Question: What is the major income of the villagers?
Answer: Main income is from rice. Other products are livestock, cashew nuts, which is 250 Baht/kg, and coconut.

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Extra fieldtrip to Phnom Kulen Mountain, Siem Reap Province on Sunday 15th October 2006

Due to limitations; the other alternative sites were not covered in the 5 day workshop.
Ms. Sudarat traveled on her own with accompanied by Mr. Sou Hay, a participant from Siem Reap Province, to see the other possible sites in Siem Reap.

9. **Spean Angkor Triage Nursery, Siem Reap – Mr. Sou Hay**
   The nursery has about 5 species, and is very big. In 2005, they planted 50 ha with about 15,000 trees mostly *Acacia* spp. in Angkor Wat World heritage park. They have made the nursery into a tourist area with restaurant and hammocks. The river nearby has a watermill for alternative energy.

10. **Mr. Suphon's office at Pradak Division Nursery**
    The next stop was the division nursery, which needed weeding and better drainage. The nursery is about 40 km from the planting site in Phnom Kulen National Park. They have 2 more nurseries in this area.

11. **Bante Srei Triage Nursery**
    This small nursery has alot of confiscated illegal log piles. This village is famous for products from woodcarvings mainly from *Afzelia xylocarpa*.

12. **Phnom Kulen National Park and Triage Nursery**
    The National Park has some areas under FA, Ministry of Agriculture. They planted some areas in 2003 with 5 species. However some parts have been flooded. Many areas around are suitable for reforestation and/or ANR. The access is via a dirt road. They have a local nursery near planting site. The planting site last year was in good condition, on flat land and many seedlings survived. Some parts of the park require a fee to be paid to enter. This mountain is in the National Park and also in Angkor Park Historical site.

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Establishment of FORRU in Cambodia on Friday 13th October 2006

Project Planning and Proposal Draft for Establishment of FORRU (Cont')

The details draft proposal, including aims, objectives and stakeholders required discussion. In May 2007, a workshop will be held in Chiang Mai to discuss the proposals with the other partners of the Darwin project.

Discussion
The discussion focused on research skills, knowledge, and training needs. In addition to the problems raised, participants also discussed terminology of forest restoration, and international agreements. The CBD and CITES were mentioned. For example, the international agreements such as matching the project with CBD Art. 12, was discussed, and it was noted that the forest policy and statement of Cambodia should also be consulted,

Mr. Saran: We should add training for data collection and analyses as well. Although the Biology Department has some equipment such as microscope to study plant biology and plant identification, we lack equipment in the herbarium.

Dr. Steve: Here are the guidelines and the criteria for selecting research sites, which should focus on degraded sites and the objectives of biodiversity recovery. The site should be in or near a protected area, because the FWSP method relies on seed dispersers. Furthermore, local people are needed to help in the process of restoration; the CF would be nice. The model site should yield good results and success, to guarantee the high performance. So an ameadable site should be selected first, before moving to more challenging sites.

Mr. Nang: The Kulen Mountain in Siem Reap is similar to Doi Suthep-Pui National Park and could be an alternative site.
Mr. Sophon: The Kulen Mountain fits about 80% of the criteria. There are some degraded areas covered by grass, hillside, waterfalls and dense evergreen forest. The degraded area is about 5 km from Kulen National Park, The park area is about 10,000 ha with natural ecosystem and wildlife; its elevation is about 200 – 500 m asl, mostly degraded site is ranged from 200 m asl. Some areas (100 ha) have been planted with acacia and the higher planted site is 5 ha plot (control plot). The area has some cattle grazing, and land is occupied for development. However, some secured areas with declaration from government are restricted.
Mr. Hay: According to a phenology survey of seed sources, we can obtain seed from a mixed deciduous forest about 50 km from Kulen Mountain with area of 100 ha. The natural seedlings can also be collected from Ankor Thom compound which is 40 km away. In addition, seeds can also obtain from the Cambodia seed center.
Dr. Steve: The planting site, seed sources and nursery should be as close as possible to each other. The primary objective is to restore biodiversity and also genetic variety. Phenology and tree inventory is possible to study in some areas that is required.
Mr. Guidal: The Aural Mountain, which has a higher elevation of 800 m asl is also good site for research.

Later Mr. Thea handed out paper work about research sites at each candidate location, to be filled in and compared. The unit establishment is up to the selected working areas that were chosen.

Mr. Saran: According to facilities, the existing project in Kho Kong with CI already has buildings. If this site were to be chosen the team could support an office for 2 -3 staff, but a nursery would have to be built.
Mr. Polo: The CI office may not last forever, it would be better to have a dedicated project office to run more research.

Dr. Steve: We need to consider what facilities needed and arrangements for transportation from the nursery to and from the planting site. You must list what are available and what are needed for each location. Other needs are the studies of soil conditions, micro climate – before and after. From FORRU-CMU experiences, we found that the planted plots are similar to natural forests after 8 years.
Other topics to be concerned are project outputs. We should specify outputs for each stakeholder and consider the output from your future project. Please think in logistic timeframe, can you finish all the tasks you planned for? One way to extend the information is via a website and/or newsletters.

Dr. Steve: How will the project contribute to capacity building? How will this be measured?
Answer: We must plan how research outputs will answer the needs of the stakeholders. The outputs concerned with capacity building must reflect strengthening local communities, knowledge sharing, better environment, and socio-economic impacts. The budget can be discussed in smaller group when we have more details and work plans.

Discussion about the manual "How to plant a forest" in Khmer version (Cont')

The discussion was very fruitful with a lot of ideas shared amongst participants. Major comments focused on the terms and species list.

Dr. Steve: The cover page should be including in original language about authors and organization in English as a fly page or back page. Please try to adapt your version to match and make it easier for Cambodians to use. The Thai version changed the English quotations to Thai quotations quoted from Buddha's scripture or speeches from famous people. You can do the same things or replace illustrations with more locally appropriate material. You are allowed to cut and add more information. However, please keep funding agencies and organizations, but you can add more collaborative organizations from Cambodia.
For the FWSP list, you should add more species that fit to Cambodia. I understand that there is a lack of information on framework species for Cambodia; however, please ear in mind that if a species was successful in Thailand, it could work in Cambodia as well (native sp.).

Comment: FWSP in the book mostly are suitable for highland forest. However, Cambodia is about 200 m asl. So we should verify the species that fit to the elevation. Forest type classification is also has to redone to suit Cambodia.

Comment: In Cambodia only *Pinus mercusii* grows naturally at 300 – 1200 m.

Dr. Steve: this book can use by people who want guidelines to try FWSP techniques. When you test techniques here also test FWSP in the field as well.

Cambodian forest tree species that are worth testing as Framework species

1. *Dipterocarpus* spp.
2. *Syzgium* sp.
3. *Afzelia xylocarpa*
4. *Mitrella mesyi*
5. *Dialium cochinchinensis*
6. *Peltophorum dasyrrhachis*
7. *Pterocarpus macrocarpus*
8. *Tateria javanica*
9. *Dalbergia bariensis*
10. *Irvingia malayana*
11. *Pentacme sauvis*
12. *Parinari sp.*
13. *Tetrameles nudiflora*
14. *Anthocephalus chinensis*
15. *Sandoricum koetjape*

After that Sudarat showed the music-visual from last Cambodian workshop as a summary of the training and activities in Chiang Mai last November 2005. The workshop was then closed.