

Kingdom of Cambodia  
Ministry of Agriculture, Forestry and Fisheries  
Department of Forestry and Wildlife  
**Cambodia Tree Seed Centre**

**Cambodia Tree Seed Project / Danida**

**National  
Priority Tree Species Workshop,  
Phnom Penh, 15 - 16 August 2000**

Publishing House  
Phnom Penh, January 2001

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Cambodian Publishing Number:

Publishing House, No.:

**CTSP Publication No. 1**

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## **I. Introduction**

The Cambodia Tree Seed Project (CTSP) is one of the components of Indochina Tree Seed Programme (ITSP) established in July 1999 after the agreement between the RGC and RGD on 'Institutional Capacity Building of the National Tree Seed Sector in Cambodia' and it is supported by RGD for 5 year from 15 October 1998 to 14 October 2003. In Southeast Asia DANIDA is responsible for giving Environmental Aid to Cambodia, Lao PDR and Vietnam through the Environment, Peace and Stability Fund of Denmark. In Cambodia the Executing Agency is MAFF/DFW's Aforestation Office. Implementation is to develop supply of good genetic quality seed and good management of seed sources to meet the need of national reforestation activities.

Following this directive, the project has conducted surveys and training to project staff including the forestry personnel from the Provinces and discussed how to identify the seed source areas, the seed source tree in natural forest, which is the important task, as well as need to provide suggestions as to involve private and local communities in selecting the seed trees for other proposes than industrial plantation. For this purpose a National Workshop on Priorities Tree Seed Species was conducted in cooperation between DFW and DANIDA.

## **II. Objective of Workshop**

The aim of a National Workshop is to discuss the selection and utilization of seed trees. At present, the aforestation and reforestation program do not identify the proper species for tree seed, especially the plus trees that would have been formed and could supply the seed according to the condition of each region. In order to identify the priority tree species, the workshop discussed three points:

1. Identify priority trees according to the general utilization in Cambodia
2. Classification of tree seed priority in relation to development work: To create the seed source, seed production, tree improvement, extension and seed supply.
3. Consider the research base on endangered species and rare species.

## **III. Workshop Implementation**

### **Opening**

The workshop had duration of two days from 15 to 16 August 2000 and was held in Juliana Hotel, Phnom Penh. Guests of honor were: H.E. Chan Sarun Under-Secretary of State of Forestry, MAFF and advisor of Prime Minister in charge of forestry; H.E. Kum Saron, Director General of MAFF; Mr. Ty Sokhun, Director General of DFW; Mr. John Stellwagen Coordinator of National Resource and Environmental Programme, CDC-DANIDA; Mr. Jens Aare Olsen, Chief Technical Adviser of Indochina Tree Seed Program. Participants in the workshop included the representatives of related institutions, international organizations, NGOs, Forest concession companies, Provincial forest and wildlife offices and personnel of Forestry and Wildlife Department, a total of 117 participants.

Mr. Ty Sokhun, Director General of Forestry, opened the workshop. In the past we knew that the lack of seed quality was a problem in reforestation and planting Programmes in Cambodia. This project is directed to seed source establishment and selecting trees in natural forests as to protect the high value and rare species. The project has helped to

build the capacity of counterpart staffs in the skills of producing and conserving the local species and to cooperate on technical exchange in the Region. Initiated by tiny seeds, not so many years later, farmers are able to harvest from trees the wood as fuelwood, poles or timber. Trees are also ornamental and provide shade for humans and animals in public areas, temples and schools. In addition, some tree species offer products such as barks, leaves, fruits, resins, vegetables and medicine.

At the present, developing countries focuses on tree plantation areas to develop commerce and industry. Plantation forestry plays a role by contributing to restoration of environmental degradation that was caused in previous decades. Forest plantations also have high yields and create many jobs for farmers. This contributes to rural development.

In Cambodia the reforestation sector is following the policy of Royal Government of Cambodia, which is emphasizing reform of forestry sector at all levels in order to maintain sustainability of resources and to increase plantations. In 1999 we planted as state-farms an area of 8,325 ha. The Department has also elaborated a 5-year strategy for rehabilitation of degraded areas of 250, 000 ha, including planting of state tree farms. Plantation of commercial trees in degraded areas and encouraging individuals to participate with plantings in their home gardens and non-forestry areas in farmland through agro-forestry and community forestry is part of the policy.

To ensure the quality of tree seedlings and fast volume increment, planters need to select genetically high quality seed, and to know seed sources that have suitable seeds of good physiological quality. This is a critical factor in achieving successful plantations. Therefore, issues of tree seed selection for planting are significant and we must select mother-tree seed sources in the nature of Cambodia. This will be studied for several years as to decide on mother trees, which is then reserved as to be seed sources. This is a process leading to use technical methods of tree seed procurement. It is also our wish to manage sustainably the natural resources to ensure that forest provide high quality products that are genetically sound to use. These forest gene resources continuously support the re-generation of trees for future generations.

The following speech of H.E. **Chan Sarun**, Under Secretary of State and advisor (in Charge of Forestry) to Prime Minister, highlighted the fact that we recognize natural forests as an important seed source for supporting the growth of trees for the next generation. While some trees in the natural forest provide acceptable seeds, most of these trees are of lesser quality. Amongst the existing commercial tree species there are to be selected seed sources and tree seed procurement programmes initiated which will take years with high investment in term of staff, finance, materials and equipment. For instance, natural tree re-growth is not an improvement of the gene source; seed collected here will give rather poor results. There are many factors affecting the result including genetic change. What is assumed a good tree may just be old or on a good site - or it may be a tree that has a high genetic potential for increment. This shows in next generation. At present, most forests are critically affected: companies, local communities or farmers conduct Logging activities in natural forests, they traditionally select only the best trees and leave behind the worst ones. Such harvesting methods lead to unavoidable long-term damage of genetic properties. Seeds collect from such a damaged forest are of poor quality. The more collection of seed from the degraded forest, the higher risk of selection of dysgenic seed. Meanwhile, trees being logged in forest concession areas are only trees that have been marked previously. Through this method some good trees are left behind and provide next generation. Selective logging some times targets only few tree species in a mixed forest by which the trees left behind loses genetic sources; particularly trees in

next generation possess gradually declining genetic properties. Following a logging operation, tree species favoring light closes the gap areas unless good logging operation and management is enforced; therefore protection of the forest gene resource is an urgent task at present.

Due to demand, utilization and high market price of valuable trees, rare and endangered species are going to be extinct locally, for instance Cha Crassna. Neng Noun Beng, Thnoug, Dey Khlar, Tatrav, Koki, Doung Chem [or Aquilaria crassna, Dalbergia bariensis, Afzelia xylocarpa, Pterocarpus spp., Gardenia ankoriensis, Fragraea fragrans, Hopea odorata and Terrietia javanica]. If no action is taken to preserve and conserve those species in proper ways from now on, next generation would not know those species. So, conservation of genetic sources of indigenous species is a critically significant contribution to protection of natural resources in the region and worldwide. Management and conservation of important species in Cambodia is an urgent mission to sustain the resources as well as to strengthen the planting of those tree species enhancing biodiversity of the nature where needed.

### Invited papers

Address by Mr. **John Stellwagen**, Co-coordinator of National Resources and Environmental Program, Danida: Cambodia is in many respects a gifted country. It has plenty of resources, natural as well as human. Your natural resources are in the best condition of the whole of Southeast Asia, and people of Cambodia have an eagerness to learn and communicate with people from all over world. I guess that many of you apart from Khmer, speaks French, Russian and English. These resources can be developed to secure a society progressing away from poverty and into a sustainable economic growth.

In May 1997 RGD and RGC agreed to work together to implement a Natural Resources Programme with a budget frame of 10 to 15 Mill. US\$ per year. The process of developing a programme and based on this, to suggest activities in a number of projects is a process of cooperation. The Danida assisted NRE- Programme will in the coming years continue to follow the concept that the programme belong to Cambodia. A partnership will be built. The first step is to investigate whether the partners share visions and objectives. As this investigation has been part of our initial work in the programming process the following results have been obtained: A) Sustainable Natural Resources Management, B) Management of Industrial and Urban Sectors and C) Awareness raising, refer to details in Annex 4.

Introduction to ITSP and CTSP and Integrated Tree Seed Procurement Strategy and Gene Resource Management by Mr. **Jens Aare Olsen**, CTA. The “ Danish Strategy for Regional Environmental Assistance in Southeast Asia “ for environmental assistance to be funded through the Danish Environment, Peace and Stability Fund (EPSF) was approved by the Danish Parliament in 1996. In Southeast Asia DANIDA is given the responsibility of providing environmental assistance to Cambodia, Lao PDR and Vietnam while DANCED under the Danish Ministry for Environment and Energy provides environmental assistance to Malaysia and Thailand.

The Project “Support to Institutional Capacity Building of the National Tree Seed Sectors in Indochina“ is a regional activity under this framework and was approved in 1998 for implementation in the tree countries Vietnam, Lao PDR and Cambodia. The Royal Danish Embassy in Hanoi is responsible for the Danish supervision of the project. The Committee for Development of Cambodia (CDC) on 14 July 1999 signed the Government

Agreement. The project period is 15 October 1998 to 14 October 2003 and implementing agency is Ministry of Agriculture, Forestry and Fisheries (MAFF) through Department of Forestry and Wildlife's Aforestation office.

### *1. Development objective*

Provision of genetically suitable seed of good physiological quality from well managed seed sources of priority woody species to meet the needs for tree planting activities in Cambodia.

### *2. Immediate objective*

Development of the institutional capacity of the national tree seed sector in Cambodia with special emphasis on indigenous species and regional co-operation.

### *3. Outputs*

The national tree seed procurement organisation strengthened

Knowledge and capabilities of selected staff at relevant national institutions upgraded and methods and technologies imparted to seed users

Methods, documentation and technologies for collection, handling and storage of Forest seed improved

National and regional strategies for conservation and use of genetic resources of indigenous priority species initiated.

### Seed procurement strategy

National Tree Seed Programmes such as Cambodia Tree Seed Programme and the future Cambodia Tree Seed Centre supported by Danida through the Cambodia Tree Seed Project (CTSP) contain four major elements:

1. Seed Procurement (collection, processing, storage and germination of seed)
2. Tree Improvement (seed sources, breeding programmes)
3. Conservation of Genetic Resources (in-situ or domestication)
4. Institutional Development (in management of genetic resources of trees)

Current terminology labels above as "Management of Genetic Resources of Trees".

### Forest Gene Resources Management

To focus activities in above areas 1-3 and utilize resources effectively an early identification and selection of priority tree species is very valuable. For priority species based on a national consensus work can be undertaken in fields such as:

1. Identify seed sources in the country
2. Identify and solve problems in seed collection, handling, storage and germination
3. Decide on investment in tree improvement (breeding programmes)
4. Institutional development.

### Project Outputs:

1. The national tree seed procurement organisations strengthened through development of proposals for appropriate policies, legal framework for and organisations of the tree seed sectors in each of the participating countries.

2. Knowledge and capabilities of selected staff at relevant national institutions upgraded and methods and technologies imparted to seed users.
3. Methods, documentation and technologies for collection, handling and storage of forest seed improved.
4. National and regional strategies for conservation and use of genetic resources of indigenous priority species initiated. (See Annex 5 for details).

Address by Mr. **Vong Sarun**, Director of Forest and Wildlife Research Institute on the contribution of priority tree species to forest sector in Cambodia. Before 1970, Cambodia had 13,227,100 ha of forest distributed all over the country. Through nearly 30 years, according to the data from GIS/RS unit in 1997, the forestland has changed (as shown in a table).

#### *Forest rehabilitation program*

The objective of RGC's forest rehabilitation program is:

- Replanting barren land for the effective conservation of ecosystems, biodiversity and environment and increase watershed potentials
- Bringing barren land into effective production to contribute in the poverty alleviation, and
- Strongly promoting fast growing tree species planting movement for environmental improvement and wood self-sufficiency.

Program target: In the five-year plan (2001-2005) Department of Forestry and Wildlife planned to plant 50,000 ha annually.

#### *Advantages of species selection*

There are several observations on which species should be planted in order to achieve the program. In general, the species selected for planting are to:

- Enable genetic conservation (in-situ conservation and ex-situ conservation combined with reforestation program),
- Match plant with site for increasing forest quality,
- Meet a variety of demands of a large-scale reforestation program.
- Meet the need of end-user

In the past reforestation in Cambodia was small scale with planting rate of approximately 500 ha per year and species were planted without studying origin or provenance. The species planted before were:

- a) Exotic species: *Acacia* sp., *Eucalyptus* sp. and *Tectona grandis*.
- b) Indigenous species: *Anisoptera glabra*, *Azadirachta indica*, *Cassia siamea*, *Dalbergia bariensis*, *Hopea odorata*, *Khaya senegalensis*, *Pterocarpus* sp., *Terretia javanica* and *Peltophorum ferruginum*.

#### *Seed selection methods*

Tree seed is the important component in a reforestation program, because through the correct selection we can get more effective production with less expense. In order to produce seed or seedlings meeting the need of the market, the seed producers and consumers have to prioritise tree species. After recognizing the priority tree seed species for the consumers, producers must produce seed based on technical procedures to provide seed with high quality and of known provenance (refer annex 6).



#### **IV. Workshop Discussions**

Through the comments and impressions of national and international guests the participants learned and developed ideas for discussion to recommend priority tree species. Participants were divided into 5 groups and each group had participants from Ministries, Provinces and Municipalities (refer Annex 7).

#### **V. Conclusions**

From discussion at the workshop many issues were identified for orientation of a tree seed management program and establishment of a strategy for genetic resource conservation and utilization of priority tree species. Some recommendations are to be implemented as when compatible with economic development of Royal Government of Cambodia (Refer annex 8 and 9).

##### **A. Strategy for Conservation and Utilization of Priority Tree Species**

Identify and select priority tree species to meet with following purposes :

##### ***1. Industrial wood species***

- Provide wood for construction, furniture, paper and plywood production.
- Ecology of these species to match planting site conditions, and ability to grow in a variety of places.
- The planting to be on large land areas for use of modern planting-tools and machinery.
- Fast growing trees with high yield per unit of land.
- Short term of Investment cycle and easy to harvest.
- Wood of good quality, easy to process and high value in the market.
- Resistance to pest and disease.
- Improve the environment.

##### ***2. Wood use species in communities:***

- Provide fuel-wood, small scale construction wood, furniture, agricultural tools, and for sculpturing.
- Ecology of these species to match planting site conditions.
- To meet requirement of local people used in multi-purpose plantations such as fuel-wood, flower, fruit, medicine and improve environment, scenery, and tourism.
- Many species, easy to plant and resistance with disease.
- Easy to process, maintain, high value, demand for use and value stable in the market.

##### ***3. Non-Wood Species***

- For uses in the local community, providing fruit, bark, leaves, medicine, resin, livestock fodder, fertilizer, fuel-wood, and wood.
- Evergreen trees, good stem form, high quality uses, resistance to pests and insects, not polluting the environment, beautiful flowers and crown, root system match with soil condition.
- Protect and improve soils and wind breaking;
- Drought resistance and suitable on poor soil.
- High yield, and harvesting process not impacting other species.

##### ***4. Endangered Species***

- Species for planting in the conservation areas improving biodiversity in National Parks

- Threatened or nearly disappearing.
- Rare species of high value in science, economic, and scenery.
- Be able to plant in mix with other species without impact on development of ecology.

The workshop has found priority tree species in the four above categories, in total 97 species, of which industrial species 17, local use species 28, non-wood species 28 and endangered species 24 (refer Annex 10)

#### B. Recommendations:

1. Improve the selection of tree seed by identification of proper seed sources.
2. Gene conservation in national forest must be located and endangered 'red list species' identified for conservation in protected areas.
3. Seed procurement (Collection, Selection, Storage and Package) to be undertaken by Cambodia Tree Seed Center.
4. Elaborate guidelines on policy for Collection, Selling and Utilization of tree seed as to:
  - Prepare the seed source documents
  - Clarify seed zoning (Guideline for seed movement between ecological areas of the gene resource )
5. Conduct training on seed procurement for locals and needing staff (refer annex 11 for details).

#### C. Related experiences:

CTSP conducted a survey on tree seed demand in Cambodia by questionnaires (refer annex 17) given workshop participants together with the invitation. Of the 135 questionnaires sent about 50 replied. Findings could not be compiled for presentation at the workshop and will later be communicated.

Parallel to the workshop a comprehensive series of workshops were undertaken in Vietnam (7) and Lao PDR (3). A summary of the outcomes has been printed in Annex 15 and 16, but were not yet available at the workshop.

### VI. Workshop Closing:

Before closing the workshop committee reported the result of the discussions to the Chairman. Then the Deputy Director of DFW. Mr. **Chea Sam Ang**, delivered concluding remarks (see Annex 12) followed by the closing speech of H.E. **Chan Sarun** Under Secretary of State, MAFF and adviser of Prime Minister in charge of Forestry (see Annex 13). He expressed gratitude to the participants for good results - and to participants from various Provinces for taking their valuable time and effort to attend the event and share ideas during two full days.

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## **Annex 1. Programme of workshop**

Agenda of National Workshop on Priority Tree Seed Species  
15 - 16 August 2000 in Juliana Hotel, Phnom Penh

### **15th August 2000:**

- 8:00-8:30 Registration.  
8:30-8:45 Welcome address by Mr. Ty Sokhun Director of DFW.  
8:45-9:00 Opening workshop by H.E Chan Sarun Under Secretary of State, MAFF.  
9:00-9:20 Address by John Stellwagen, Coordinator CDC/Natural Resource and Environmental Programme  
9:20-9:50 Introduction to ITSP and CTSP. Introduction to Integrated Tree Seed Procurement Strategy and Gene Resource Management by Jens Aare Olsen, CTA.  
9:50-10:00 Present knowledge of priority tree species by Mr. Vong Sarun, Chief of Forest Research Institute.  
10:00-10:20 Introduction to workshop modality and establishment of groups and working topics by Mr. Ma Soktha NPM of CTSP.  
10:20-10:50 Coffee break  
10:50-12:00 Work in groups  
  
12:00-14:00 Lunch  
  
14:00-15:00 Work in groups  
15:00-15:30 Coffee break  
15:30-17:00 Continue working in groups  
  
18:00 Workshop cocktail

### **16th August 2000**

- 8:30-10:00 Continue working groups  
10:00-10:30 Coffee break  
10:30-12:00 Presentation from groups  
  
12:00 Lunch  
  
14:00-15:00 Continue working in groups  
15:30-16:00 Coffee break  
16:00-16:30 Follow-up by Jens and Ma Soktha  
16:30-17:00 Report the result of the workshop by Mr. Ty Sokhun DG DFW  
17:00-17:30 Closing of workshop by H.E. Chan Sarun, Under Secretary of State, MAFF

**Annex 2. Welcome address of Mr. Ty Sokhun, Director General of Forest, DFW, MAFF**

Welcome Speech by Mr. Ty Sokhun  
Director General of Department of Forestry and Wildlife  
The Opening of Workshop on Priority Tree Species  
August 15th, 2000  
Hotel Juliana, Phnom Penh

My respect to:

- H.E. Chan Sarun, Under State Secretary of State for the MAFF and Advisor (in charge of Forestry) to Prime Minister
- John Stellwagen, Coordinator, Natural Resource and Environmental Programme, Danida/EPSPF
- Jens Aare Olsen, Chief Technical Advisor for Indochina Tree Seed Programme, Danida

Your Excellency, Ladies, Gentlemen, Distinguished Guests and Participants. Today, it is a great opportunity and honor to address H.E Chan Sarun and you Ladies, Gentlemen, National and International Representatives and Distinguishes participants in the workshop on " Priority Tree Species". On behalf of the Department of Forestry and Wildlife, I would like to convey my sincere respect and warm welcome to H.E. Chan Sarun, Ladies and Gentlemen; you will make the workshop great and happy.

Your Excellency, Ladies and Gentlemen, National and International Guests!

The Department of Forestry and Wildlife in collaboration with Danida has established the Cambodia Tree Seed Project which is implemented from 1999 to 2003 on the budget of 758,000 USD which is a grant support from Government of the Kingdom of Denmark aiming to provide genetically suitable seeds of physiological quality from good technical seed source management to meet the needs for tree planting activities in Cambodia. In the past we knew that the lack of seed quality was a problem in reforestation and planting programmes in Cambodia. So, the project has the direction to seed source establishment and selecting trees in natural forests as to protect the high value species and rare species. Meanwhile the project has helped to build the capability of counterpart staffs in the skills of producing and conserving the local species and to cooperate on technical exchange in the region.

Meanwhile, I am happy that the workshop has representatives of related institutions and agencies and at the end of the workshop I hope that a set of recommendations for implementation of the project and production of indigenous priority tree seed for planting trees and reforestation in Cambodia.

As Your Excellency, Ladies and Gentlemen are aware utilization of tree seed for planting has taken place for a long time in the agricultural crop and use of non-wood trees in the local communities is common. Initiated by tiny seeds, not so many years later, farmers are able to harvest the trees as wood, fuel wood, poles, timber and ornaments. Trees provide shade for humans and animals in public areas, temples and schools. In addition, some tree species offer products such as barks, leaves, fruits, resins, vegetables and medicine.

At the present, developing countries focuses on increasing the tree plantation areas as to develop commerce and industry. Particularly plantation forests play a role in contributing

to restoration of environmental degradation that was caused this decade. Meanwhile, forest plantation products also give high yield and create many jobs for farmers. This contributes to rural development.

Particularly, in Cambodia reforestation sector is following the Royal Government of Cambodia's policy, which is emphasizing reform of forestry sector at all regional levels in order to maintain sustainability of the resources and to increase plantation activities and reforest the non-forested provinces and degraded areas. For instance, up to 1999 we planted trees as state-farms on an area of 8,325 ha. The Department has also planned a 5-years strategy for rehabilitation of degraded areas of 250,000 ha. including planting as tree-state farms, plantation of commercial trees in degraded areas and encouraging individuals to participate in planting in home gardens and non-forest areas in farm land through agro-forestry and community forestry.

To ensure the quality growth of tree seedlings and fast volume increment, planters need to select genetically high quality seed, and to understand well the seed sources that have suitable seeds for plantation areas planned. Practices leading to supply of genetically suitable seeds of good physiological quality is a critical factor in achieving successful plantations. Therefore, issues of tree seed selection for planting are significant and we must select mother-tree sources in the nature in Cambodia, which will then be planted in the farms. This will be studied for several years as to decide on mother tree sources, which is then reserved as to be tree seed sources. This is a process leading to use of technical methods of tree seed procurement and it is also our wish to manage sustainably the use of natural resources to ensure that plantation forest provide high quality products and are genetically sound to use. These gene sources continuously support the re-generation of trees for future generation.

Corresponding to above facts, the Department of Forestry and Wildlife with support and cooperation of Danida organized the 'National Workshop on Priority Tree Species', and I believe that the workshop will provide capacity and more knowledge in the selection and use of seed sources for tree plantation purpose and reforestation in the whole nation. Taking this chance, I would like to express my acknowledgement to Danida of the Royal Government of Denmark as represented by Mr. Jens Aare Olsen, CTA of Indochina Tree Seed Programme which is assisting with technical resources and financing to meet the long time wish of all Cambodians and this dream is appearing, and to welcome warmly Your Excellency, Ladies and Gentlemen who will contribute perspectives, opinions and experiences to this workshop.

I wish this workshop process to be successful for the future development of Cambodia's sustainable forest sector. Thank you.

**Annex 3. Opening speech of H E Chan Sarun, Under Secretary of State (Forestry), MAFF**

Opening Speech by H.E. Chan Sarun  
Under Secretary of State for MAFF and  
Advisor (in charge of Forestry) to Prime Minister  
The Opening of Workshop on Priority Tree Species  
August 15th, 2000  
Hotel Juliana, Phnom Penh

- Mr. John Stellwagen, Co-coordinator of Natural Resources and Environmental Programme, Danida
- Mr. Jens Aare Olsen, CTA of Indochina Tree Seed Programme, Danida
- Mr. Ty Sokhun, Director General of Department of Forestry and Wildlife

Ladies and Gentlemen, Distinguished Guests and Participants!

Today, I am, on behalf of MAFF, very pleased and have a great honor in presiding over the opening of the 'National Workshop on Priority Tree Species'. I would also like to take this opportunity to express my deep acknowledgement of the presence of His Excellency, Ladies, Gentlemen, Distinguishes National and International Guests and participants that are spending valuable time and efforts to attend the event today.

As you are aware, an agreement on Cambodia Tree Seed Project had been signed by the Royal Government of Cambodia and the Royal Government of Denmark, on July 14, 1999 aimed to provide genetically suitable seed of good physiological quality from well managed seed sources to meet the needs for tree planting activities in Cambodia. The project objective is also to strengthen capacity building of the institutions of the national tree seed sector in Cambodia in order to improve the implementation of plans according to the forest policy of the RGC.

In fact, we recognize that natural forest is always an important seed source for supporting the growth of trees for the next generation. While some trees in natural forest provide acceptable seeds, most of these trees in the nature are of lesser quality. Amongst the existing commercial tree species there are to be selected seed sources and tree seed procurement programmes initiated which will take years with high investment in terms of finance, materials and equipment. For instance, natural tree re-growth is not improvement of the gene sources and the result of such seed collection process will give poor results. There are many factors affecting the results including genetic change. Even what is assumed a good tree as you see it with your eyes may be just old - or it may be a tree that has a high genetic potential for increment. This shows up in next generation of growth as the selection of tree seed is taken from such a natural forest for seed sources. At present, most forests are critically affected: Logging activities in natural forests are conducted by companies, local communities or farmers in the area where their traditional harvests select only the best trees and leave behind the worst ones. Such harvesting methods lead to unavoidable long-term damage of genetic properties. Seeds collected from such damaged forests are of poor quality. The more collection of seeds from the degraded forest, the more a risk of selection of dysgenic seed is encountered. Meanwhile, trees being logged in forest concession areas are only trees that have been marked previously. Through this method some good trees are left behind and provide a next natural generation, while selected logging, some times, is targeted to only few tree species in a mixed forest by which the trees left behind loses genetic sources, particularly trees in next generation

possess gradually declining genetic properties. Following the logging operation, tree species favoring light closes the gap areas unless good logging operation and management in the concession is enforced, therefore protection of the gene resource is an urgent task at the present.

Due to demand and utilization and high market price of commercial trees, rare and endangered species are going to be extinct locally, for instance Cha Crassna, Neng Noun, Beng, Thnoug, Dey Khlar, Tatrav, Kokie, Doung Chem [Aquilaria crassna, Dalbergia bariensis, Afzelia xylocarpa, Pterocarpus spp., Gardenia ankoriensis, Fragraea fragrans, Hopea odorata and Terrietia javanica]. If no action is taken to preserve and conserve those species from now on and in the proper ways, next generation would not know these species. So, conservation of genetic sources of indigenous species is of critical significance in the contribution to protection of natural resources in the region and worldwide. Management and conservation of important species in Cambodia is an urgent mission to sustain the resources as well as to strengthen the planting of those tree species and reforestation, which is a national asset, particularly enhances biodiversity of the nature where needed.

Your Excellency, Ladies and Gentlemen, under the financial assistance of the Royal Government of Denmark through Danida acting as a coordinator for five Southeast Asia countries - Cambodia, Indonesia, Laos, Thailand and Vietnam - which are developing a cooperation to rehabilitate environment and natural resources of each country, to train and build up human capacity in the institution and to exchange experiences and scientific information, to provide a tree seed center and seed source areas, by which it makes forested areas in Southeast Asia maintaining tree gene pool gradually. Meanwhile, Cambodia needs to restore the baseline information and data and scientific documentation on tree species and to classify all forests existing at moment as following:

- Collect comprehensive statistics of commercial and valuable tree species as well as rare ones and classify them: endangered, tree species with fibers, medicinal plants and well adopted tree species to all climates and environmental conditions,
- Write history for humanity to understand and protect nature and culture,
- Establish a budget for tree seed projects in order to plant in a given area or similar development.

To implement the above tasks it is necessary to have finance and technical assistance and more efforts from professional forest institutions.

The workshop today aims to present to all participants the utilization of priority tree species that supports reforestation in the Provinces based on the discussion topics and outcome from group discussions. Comments, suggestion and recommendation of the attendees are welcome and appreciated in order to develop a strategy for management and use of tree seed sources in proper and improved ways.

Lastly but not least, I would like to acknowledge DANIDA that fully supports the development of Cambodia Tree Seed Project, particularly thanks to Mr. Jens Aare Olsen, CTA and project staffs and counterparts that contribute efforts and time to organize such a workshop.

I wish Your Excellency, Ladies, Gentlemen and participants success in our task and would like to declare the workshop open. Thank you.



**Annex 4. Mr. John Stellwagen, Co-coordinator, National Resources and Environmental Programme, Danida / CDC**

The Opening of Workshop on Priority Tree Species  
August 15th, 2000  
Hotel Juliana, Phnom Penh

Your Excellencies – distinguished guests – ladies and gentlemen.

I am pleased on behalf on the Danish aid agency Danida to be invited to give an address to you at the opening of this workshop on Priority Tree Species being part of Cambodia Tree Seed Project and I will like to welcome you all.

Cambodia is in many respects a gifted country. In one area in particular Cambodia is outstanding. It has plenty of resources, natural as well as human. Your natural resources are in the best conditions in the whole of Southeast Asia, and people of Cambodia have an eagerness to learn and communicate with people from all over world. I guess that many of you apart from Khmer, speaks French, Russian and English. Both of these resources can be developed to secure a society progressing away from poverty and into a sustainable economic growth.

My country, Denmark, and Cambodia decided as early as May 1997 to work together to implement a Natural Resources and Environmental Programme, which should have a long perspective, 10 to 15 years, and a comparative high budget frame of between 10 to 15 Mill. US\$ a year when fully operating.

The process of developing a programme and based on this to suggest activities in a number of projects are a process where our two countries need to work closely together. The Danida assisted NRE-Programme will in the coming years, actually throughout the whole period of implementation, continue to follow the concept that the programme belongs to Cambodia. Therefore a partnership will be built. A first step in building a partnership is to investigate whether the partners share visions and objectives. As this investigation has been part of our initial work in the programming process the following overhead show visions by the RGC:

**FIRST OVERHEAD (VISIONS)**

**PARTNERSHIP BETWEEN THE RGC AND DANIDA**

*Sharing Visions and Objectives*

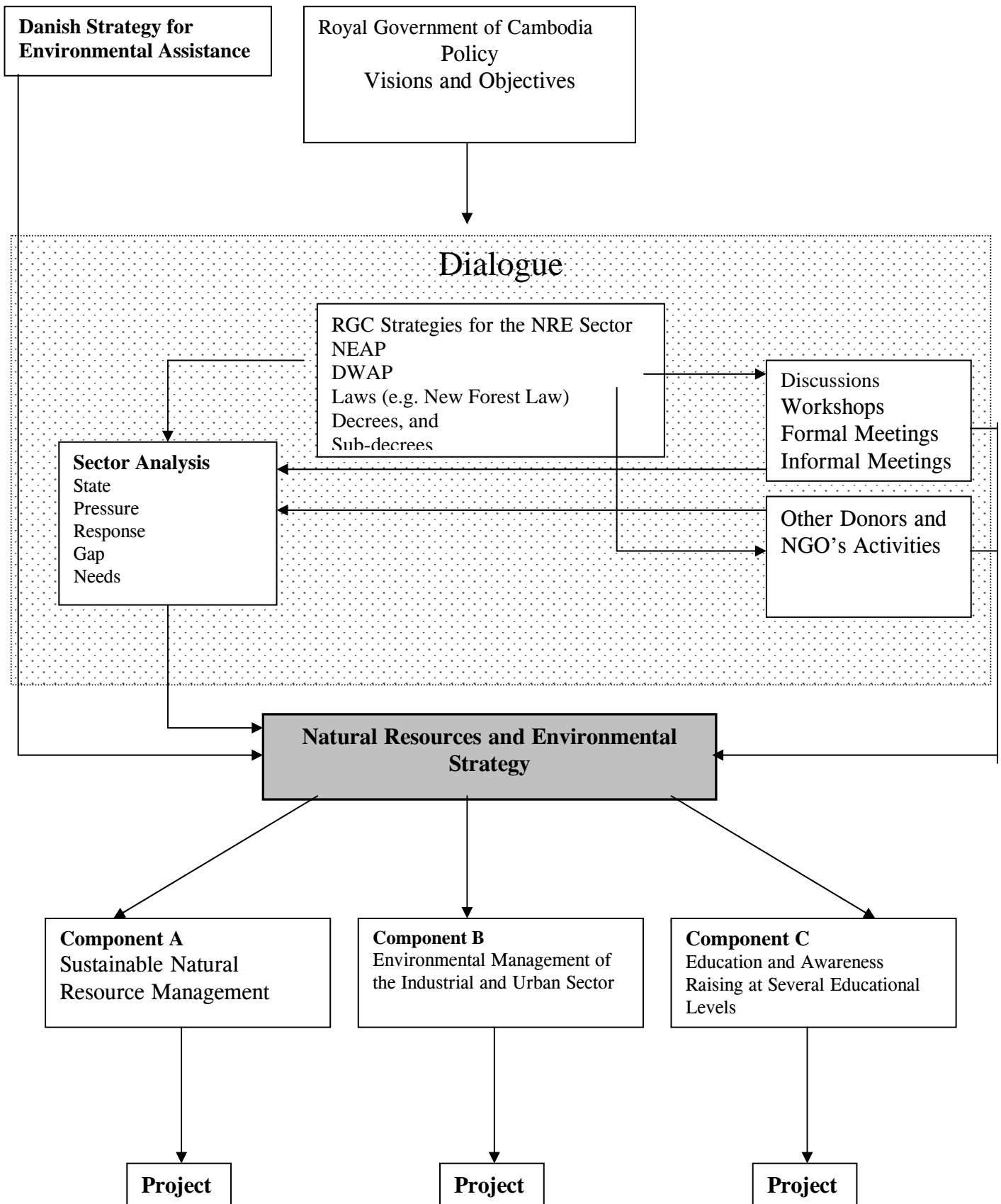
1. That the overriding goal is to reduce poverty
2. That sustainable livelihood can be achieved by wise utilization of natural resources and mitigation of negative environmental impacts
3. That the people of Cambodia – the communities – play an important role in the management of natural resources
4. That women and men play an equal important role in the development of Cambodia

5. That increased production in rural – as well as in urban areas are essential to reduce poverty
6. That the private sector will be a key player in the further development of Cambodia
7. That the Government and the civil society are partners in developing Cambodia
8. That the Government will increase it's capacity at all administrative levels
9. That an integrated approach will be used to plan and implement sustainable natural resources and mitigation of negative environmental impacts
10. That donors are partners and facilitators in this process

We share these visions, but partnership is a number of other things as showed by the following overhead, Let us now go to where we are today:

In the previous period, from November 1999 until now, much time have been used to analyze this huge sector we call the Natural Resources and Environmental Sector. This has included problem analysis, present state in the different sub sectors, and pressures on the sub sectors, constrains and needs. On this background a table has been developed which summarize the analyses (see next page).

**SECOND OVERHEAD (SECTOR ANALYSIS)**



It should be mentioned that the sectors are of a crosscutting nature. The sector analysis is still incomplete and need additions and maybe a revision.

Any partnership needs dialogue. To develop a strategy makes no exception. In order to be informed by the state, pressure, response, gaps and needs in the different sub sectors, action plans, laws, decrees, policy papers, status reports, other donors analysis etc. has been included as an addition to the oral dialogue, I have already mentioned. On this background a draft strategy has been developed:

### **THIRD OVERHEAD (THE STRATEGY PROCESS)**

The strategy statements at this point of the development can be presented as follows:

### **FOURTH OVERHEAD (STRATEGY STATEMENTS)**

Based on the sector analysis and the strategy statements, where and how assistance should be given can be specified and objectives can be formulated.

### **FIFTH OVERHEAD (COMPONENT AND PROJECTS)**

This is where we are today. We need your input, comments, good ideas and critical remarks to continue the process of developing a realistic NRE-Programme to be implemented in the coming years in Cambodia.

Throughout the implementation of the programme there will be a strong focus on capacity building. However, we have to realize that capacity building is only a tool. Our success will eventually not be measured based on how many laboratory in function, how many persons capable to use advanced computer software or how many ministries capable to coordinate their efforts. NO – The success will be measured out there!! On improvement of the water quality of the rivers, on the quality of our drinking water on the amount of fish caught, but first and foremost on the improved living standard and well being of the people of Cambodia. When we can show that – we have together been successful.

[For a comprehensive insight to the Programme kindly refer to the later developed Project Document for ‘Capacity Building Project in Natural Resources and Environment in Cambodia’ available at CDC].

## **Annex 5. Introduction to the project and workshop by Mr. Jens Aare Olsen, Chief Technical Adviser, Danida**

The Opening of Workshop on Priority Tree Species  
August 15th, 2000  
Hotel Juliana, Phnom Penh

Introduction to Indochina Tree Seed Programme and Cambodia Tree Seed Project:

### Cambodia Tree Seed Project - CTSP - in brief:

CTSP is part of the regional project 'Support to Institutional Capacity Building of the National Tree Seed Sectors in Indochina' receiving funds from the Danish Environment Facility.

The "Danish Strategy for Regional Environmental Assistance in Southeast Asia" for environmental assistance to be funded through the Danish Environment, Peace and Stability Fund (EPSF) was approved by the Danish Parliament in 1996. In South East Asia Danida is given the responsibility of providing environmental assistance to Vietnam, Lao PDR and Cambodia while DANCED under the Danish Ministry for Environment and Energy will provide environmental assistance to Malaysia and Thailand.

The project "Support to Institutional Capacity Building of the National Tree Seed Sectors in Indochina" is a unique regional activity under above framework and was approved in 1998 for implementation in the three countries Vietnam, Lao PDR and Cambodia. The Royal Danish Embassy in Hanoi is responsible for the Danish supervision of the project. The project period is 15 October 1998 to 14 October 2003 and implementing agency is Ministry of Agriculture Forestry and Fisheries (MAFF) through the Aforestation Office of Department of Forestry and Wildlife.

During the first year two training courses were held for CTSP and Provincial Forestry staff on issues pertaining to improved tree seed quality with over 45 participants. Topics covered ranged from seed collection to seed source management and tree improvement. A range of equipment including two vehicles is being supplied and technical papers and manuals written for translation into Khmer. Further experimentation, training, planning and conservation work will be based on promotion of indigenous species. The project is actively co-operating with Danida Forest Seed Centre in Denmark and sister projects in Thailand, Indonesia, Vietnam and Lao PDR and participates in regular consultations.

### Project Logical Framework

#### 1. Development objective

*Provision of genetically suitable seed of good physiological quality from well managed seed sources of priority woody species to meet the needs for tree planting activities in Indochina (Cambodia).*

#### 2. Immediate objective

*Development of the institutional capacity of the national tree seed sectors in Indochina (Cambodia) with special emphasis on indigenous species and regional co-operation.*

### 3. Outputs

#### **I. The national tree seed procurement organisations strengthened through:**

##### *A. Development of proposals for appropriate policies, legal framework for and organisations of the tree seed sectors in each of the participating countries.*

I.1 Prepare proposals for institutional set-up in each country with focus on the counterpart institution

I.2 Carry out a National Baseline Survey in each country on priority species

I.3 Host National Workshops identifying priority species

I.4 Propose integrated seed procurement strategy for each country

I.5 Support policy formulation

I.6 Carry out marketing and pricing studies supporting financial sustainability

##### *B. Appropriate rehabilitation of existing key facilities at Reforestation Office, Cambodia.*

I.7 Rehabilitation of existing facilities at host institutions

I.8 Rehabilitate (or Procure and install) basic seed procurement equipment at host institutions

I.9 Establish a tree seed library at each host institution

##### *C. Collaboration and liaison*

I.10 Support National, Intra-project, Regional and International collaboration, particularly with other Danish funded tree seed projects in S E Asia

#### **II. Knowledge and capabilities of selected staff at relevant national institutions upgraded and methods and technologies imparted to seed users.**

##### *A. Education and Training*

II.1 Technical training of host institution staff in each country

II.2 Scholarships for Cambodia (3 M.Sc.)

II.3 Elaborate Annual training plan and support training in each country

II.4 Plan and implement approximately 18 Technical Fellowships

##### *B. Information and Extension*

II.5 Prepare and disseminate Technical papers and training materials

II.6 Prepare and disseminate Extension materials for seed user

II.7 Support Seed user training through relevant institutions

II.8 Establish Demonstration plots with key stakeholders

#### **III. Methods, documentation and technologies for collection, handling and storage of Forest seed improved.**

III.1 Collaborative workplans with key partners such as Forest Research Institutions

III.2 Host Regional Technical Workshops

III.3 Plan and initiate Seed Biological and other Technical studies

III.4 Explore Seed collection, storage and sowing practices of designated priority species

III.5 Carry out Seed biology literature studies

III.6 Develop Laboratory routines and document as a manual

#### **IV. National and regional strategies for conservation and use of genetic resources of indigenous priority species initiated.**

- IV.1 Explore and register selected indigenous priority species as Seed sources in each country
- IV.2 Prepare national Seed zoning system as needed in each country
- IV.3 Identify national objectives in Conservation of indigenous, priority species
- IV.4 Identify partners in gene resource conservation
- IV.5 Activate partners
- IV.6 Short list endangered woody species

National Tree Seed Programmes contain four major elements:

- 1. Seed Procurement (collection, processing, storage and germination of seed)
- 2. Tree Improvement (seed sources, breeding programmes)
- 3. Conservation of Genetic Resources (in-situ or domestication)
- 4. Institutional Development (in management of planting materials of trees)

These four elements combined are considered as *Management of Genetic Resources of Trees*.

To appropriately focus activities in above areas 1 to 3 and utilize resources effectively an early identification and selection of priority tree species is very valuable. For priority species based on a national consensus, work can then be undertaken in fields such as the following four:

- 1. Identify seed sources within the country
- 2. Identify and solve problems in seed collection, handling, storage and germination
- 3. Decide on investment in tree improvement (breeding programmes)
- 4. Institutional capacity development, contain activities such as these four:
  - a. Establishment of a Tree Seed Centre (Seed supply, Tree Improvement Programmes, Gene Resource Conservation, Training & Extension)
  - b. Integrated Tree Seed Procurement Strategy (central or de-central)
  - c. Gene Resource Conservation Strategy (listing endangered species and placing conservation responsibilities)
  - d. Policy guidelines on seed collection, sale and use such as:
    - 1. Seed Source Documentation (a published national list of all sources)
    - 2. Seed Lot Documentation and Labeling (possibly including certification rules & regulations)
    - 3. Seed Zoning System (a guide on safe movement of genetic resources within defined ecological zones).

Details can be found in: 'Danida Forest Seed Centre Strategy 2000-10', January 2000, Humlebæk, Denmark.

## Tree Species Selection Process

### *Identification and Selection of Priority Tree Species for Cambodia.*

Introduction: In Cambodia there is an estimated 3,000 woody species of which 200 are plantable. In the recent decade Government planting programmes have focused largely on exotics such as Eucalyptus, Acacia and Tectona grandis.

Only limited data is available on each tree species regarding its distribution, propagation, wood properties and market value. This leads to an initial screening through a *participatory process* such as today's workshop with representatives from forest and seed source owners and managers mainly at Government and Provincial level and supporting Institutes and NGO's. The findings can be augmented with questionnaires and interviews of key stakeholders such as end-users and developing of strategies for support to the four items listed under introduction.

In the workshop one can discuss from personal experience the present planting, or whether it is envisaged to increase or decrease for individual species. We can also review the estimated annual planting in Cambodia i.e. actual hectares per species in 1999 and expectations for near future up to 2010. It is often convenient to establish groups of trees according to end use, wood properties, growth characteristics or socio-economic importance



## **Annex 6. Present knowledge on priority tree species, Mr. Vong Sarun, Chief of Forest and Wildlife Research Institute, DFW, MAFF**

Contributions by priority tree species in the forest sector in Cambodia  
By Mr. Vong Sarun, Director of Forest and Wildlife Research Institute

### Introduction

A wide range of latitude and altitude and wide variety of landform from delta to high land has given the country a great diversity of natural environment and high biological diversity. As a result, Cambodia has abundant and diverse natural forest resources, which is characterized by several types of forest.

- a. Low land evergreen forest occurs in the North of Tonle Sap Lake and East of Mekong River,
- b. High land evergreen forest are found in Coastal Zone and North-Eastern part of the country,
- c. Most of the low land areas and north and eastern highland are occupied by deciduous and semi-evergreen forest,
- d. Forest on limestone are found in some areas of Kampot and Battambang Provinces,
- e. Coniferous forest exist in Kirirom Range, Mondul Kiri, and an area between Siem Rep and Kampong Thom Provinces as dominant or mixed with broad leaves species,
- f. Inundated forest occurs around Tonle Sap Lake, especially in Siem Rep Province,
- g. Mangrove and rare-mangrove forest are dominant in the Western Areas along the coast line,
- h. Bamboo exists as pure stands or mixed with timber stands in Mondul Kiri and Battambang Provinces.

### Forest change

Before 1970, Cambodia had 13,227,100 ha of forest distributed all over the country. Through nearly 30 years, according to the data from GIS/RS unit in 1997, the forestland has changed and categorized as showing in [refer appendix ..].

### Forest rehabilitation program

#### **a. Objective**

The objective of the forest rehabilitation program aims at:

- Replanting barren land for the effective conservation of ecosystem, biodiversity and environment and increasing watershed potential,
- Bringing barren land into effective production to contribute in the poverty alleviation, and
- Strongly promoting fast growing tree species planting movement for environmental improvement and wood self-sufficiency.

#### **b. Program target**

In the five years plan (2001- 2005) Department of Forestry and Wildlife plans to plant 50,000 ha annually.

### Advantage of species selection

There are several comments on which species should be planted, in order to reach the program. In general, the species selected for planting are to:

- Enable genetic conservation (in-situ conservation and ex-situ conservation combined with reforestation program),
- Match plant with site for increasing forest quality,
- Meet the need of end-user, and
- Meet variety demand of large-scale reforestation program.

In the past reforestation in Cambodia was small scale with the planting rate approximately 500 ha per year and species were planted without studying its origin or provenance. The species planted before were:

#### **a) Exotic species:**

- Acacia hybrid
- Acacia auriculiformis (Acacia auri)
- Acacia mangium (Acacia sleuk thom)
- Eucalyptus camaldulensis (Preng kyal)
- Eucalyptus tereticornis (Preng kyal)
- Eucalyptus grandiflora (Preng kyal)
- Eucalyptus europheya (Preng kyal)
- Tectona grandis (May sak)

#### **b) Indigenous species**

- Anisoptera glabra (Phdeak)
- Afzelia xylocarpa (Beng)
- Aquilaria crassna (Chann krasna)
- Azadirachta indica (sdav)
- Cassia siamea (Ang kanh)
- Dalbergia bariensis (Neang nuon)
- Dipterocarpus alatus (Chheuteal toeuk)
- Khaya senegalensis (Kroabek)
- Hopea odorata (Koki msav)
- Pterocarpus macrocarpus (Thnorng)
- Tarrietia javanica (Daun chem)
- Peltophorum ferrugineum (Trosek prey)

### Seed selection methods

Tree seed is the important component in a reforestation program, because through the correct selection we can get more effective production with less expense. In order to produce seed or seedling meeting the need of market, the seed producer and consumer have to prioritize tree species. After recognizing the priority seed species for the consumer, producer must produce seed based on technical procedures to provide seed with high quality and of known provenance.

#### **5.1 Seed production zone preparation**

A seed production zone should be selected in natural forest or plantation with flat landform, well drain, trees not so young or old, and area at least 5 ha.

### **5.1.1 Seed production zone demarcation**

After determining seed production zone, the boundary should be identified by opening a line of 2 m wide around the seed production zone and demarcation with red paint on the trees. Beside this demarcation the zone have to be divided into small lots of 1 ha area.

### **5.1.2 Signboard**

In order to easy recognize the site and avoid local people disturbing the seed production zone a signboard should be established.

## **5.2 Seed stands**

### **5.2.1 Characteristic of seed stands**

The characteristics of seed stands are the following:

- High straight stems,
- Healthy,
- Big canopy (the angle between the stem and branch are close to 90 degree).
- Middle age (not too old nor too young),
- The neighboring tree should have nearly the same quality.

### **5.2.2 Identification number of plus trees**

The tree selected to be plus tree have to be marked with identification number and other information of each plus tree such as height, age, crown, location, and distance to road is to be recorded.

### **5.2.3 Preparations of seed production stands**

In order to get good quality seed from a good seed stand with abundance of good seed, we have to remove the inferior trees. Other trees that are not considered to be seed stand (e.g. grow too closely to the seed stand) are also to be removed or to ring the bark of the tree as not to fall on the seed stand to break the branches.

### **5.2.4 Clearance around the seed stand**

Around the seed stand we have to remove the weeds within 9m radius. The removal of the weeds is better for seed collection, but avoid disturbing the soil around the seed stand. Another way is to lay the net or plastic cloth under the seed stand, but if the small tree under the seed stand is valuable and we don't want to remove them, then we hang the net or plastic cloth above them.

## **5.3 Seed collection**

Seed collection is one of the most important works in seed production program, because we must collect during seed maturity otherwise it will be damaged or loose quality (some seed have a short germination period). Seed collection can be done by crown collection (climbing) or ground collection.

## **5.4 Seed store**

After collection the seed should be cleaned, dried and packaged immediately, then transported to the seed store with suitable temperatures or sent directly to nurseries for production of seedlings. Good implementation follows the technical instructions given us - and seed with high quality responds to the need of the consumer.

## Annex 7.1 List of participants

**List of Participants**  
National Workshop on Priority Tree Species  
15 - 16 August 2000, Juliana Hotel, Phnom Penh, Cambodia

N°	Name Participant	Institution	Contact Tel.
1	Mr. Uk Syphan	DFW	016 881.988
2	- Chea Sam Ang	DFW	012 862.730
3	- Ma Soktha	Reforestation office	023 215.034
4	- Suon Bunthan	Reforestation office	012 858.256
5	- Soth Onn	Reforestation office	012 930.958
6	Ms. Vong Sopanha	Forest Research Institute	
7	Mr. Long Bong	Forest Research Institute	012 946.667
8	- Uon Samol	Forest Research Institute	016 863.441
9	- Meak Vuthy	Reforestation office	012 863.441
10	- Vong Sokserey	Reforestation office	012 824.009
11	- Luong ChanTanaroth	Reforestation office	016 886.420
12	- Hong Kim Hean	Reforestation office	
13	- Chay Chetha	Forest Management Office	012 827.387
14	- Sor Ro	Forest Management Office	
15	- Kit Bunna	Forest Management Office	016 880.299
16	- Vong Sarun	Forest Research institute	012 909.117
17	- Chhang Phorin	Forest Research institute	012 853.436
18	- Phan Phoeun	Forest Research institute	
19	- Loa Sethaphal	Reforestation office	012 827.915
20	Mrs. Im Maredi	Reforestation office	012 897.104
21	Mr. Tep Samay	Reforestation office	
22	- Pich Nerong	Reforestation office	012 897.767
23	- Nhek Sonnary	Reforestation office	016 828.754
24	- Nup Sothea	Reforestation office	012 914.118
25	- Y Chheang Meng	Reforestation office	
26	- Sean Srun	Reforestation office	
27	- Pou Vanarith	Reforestation office	016 828.399
28	- Leov Bunthon	Reforestation office	
29	- Hun Eang	Reforestation office	015 921.971
30	- Kruey Timeng	Reforestation office	
31	- Seng Sitarun	Reforestation office	012 886.841
32	- Noun Pov Rathana	Reforestation office	012 891.234
33	- Kong Puthera	Reforestation office	012 872.163
34	- Ly Eang Sao	Reforestation office	
35	- Chea Buntha	Reforestation office	012 893.359
36	- Hor Dara	Reforestation office	
37	- Pov Boramy	Reforestation office	
38	- Net Samon	Reforestation office	015 850.617
39	- Yann Kim Horn	Extension Department	
40	- Sokhorn-Rithikhun		
41	- Boeuy Phal	RUA	
42	- Hong Daravuth	Ministry Environment	
43	- An Dara	Ministry Environment	

44	- Srey Marona	Ministry Environment	
45	- Kim Sarin	Ministry Environment	
46	- So Sunthara	Preak Leap School	
47	- Pheth Phainong	Bantey Mean Chhey	
48	- Kul Sovann	Prey Veng PFO	012 839.727
49	- Chann Chesda	Mondulkiry DAFF	011 873.016
50	- Chuon Sara	Kampot PFO	012 885.464
51	- Roeung Sophat	Kampong Cham PFO	012 838.942
52	- Hem Sophat	Paylin CFO	016 866.067
53	- Soun Som	Takeo PFO	015 920.959
54	- Touch Buntheang	Koh Kong PFO	011 812.525
55	- Yon Yovakrith	Kandal PFO	
56	- Pav Samanark	Sihanoukville CFO	012 809.559
57	- So Than	Kampong thom PFO	012 809.556
58	- Keo SengKry	Kampong speu PFO	
59	- Chan Tak	Svay Reing PFO	
60	- Thorng Salim	Pusath PFO	
61	- Mak Vanny	Kampong Chhnang PFO	
62	- Hort Sothea	Rattanakiri PFO	
63	- Hong Phea	Kratie PFO	
64	- You Vay	Kep city	012 922.091
65	- Tea Kim Soth	Kep city	
66	- Ith Phumra	Sihanoukville CFO	
67	- Doung Socheat	Sreung Treng PFO	012 892.666
68	- You Kanvimean	Sreung Treng PFO	
69	- Sorm Chanrith	Sreung Treng PFO	
70	- Ke Phon Khemarith	Phnom Penh City CFO	
71	- Em Mony	Siem Reap PFO	
72	- Toch Mony	Battambang PFO	012 917.440
73	- Pe Kuy Heng	Preah Vihea PFO	
74	- Leng Sithou	Sam Rong Wood Company	
75	- Nut Unvanheng	Colexim Forest Company	
76	- Kong Darith	Colexim Forest Company	015 851.375
77	- Re-Timass.co	Timas Resource ltd	
78	- Taing Chy	Timas Resource ltd	
79	- Toun Hav	Hero Taiwan co	
80	- Rey Naldo Buendia	S.L Company	
81	- Chhoun chhieng	Silverroad Company	
82	- Nor Vanndy	Mieng lyHeng Company	
83	- Chai Kim Sroon	King wood Company	012 988.558
84	- Kun Monira	GAT International Company	023 218.135
85	- Zhao Shuwang	Silverroad Company	023 210.375
86	Mr. Kengo Yoshida	JICA	
87	Mr. Sour hay	FAO Siem Reap	
88	Mr. Bruno Cammaert	FAO Siem Reap	
89	Mr. Min Bunna	GTZ / MRC	012 839.960
90	Mr. Jurgen Fichtenau	CTZ/CGFP	
91	Mr. Khieng Sobunthoeun	CARERE Pursat	012 913.539
92	Mr. Sous Pinreak	CARERE Rattanakiri	
93	Mr. Hak Sarom	AFSC	

94	Mr. Phung Sila	CIDSE	
95	Mr. Kao Vutha	GTZ Kampong thom	
96	Mr. Gerhard Gastel	PRASAC Takeo	
97	Mr. Khann Kanha	PRASAC Kampong Speu	025 987.252
98	Mr. Pel Piseth	CONCERN Centre	012 887.327
99	Ms Danny	CONCERN	012 842.802
100	Mr. Noy Samol	CONCERN, Kampong Chhnang	026 938.753
101	Mr. Khun Bunnath	CONCERN Pursat	
102	Mr. Chan Theavy Khieu	WFP	
103	Mr. Sim Samoeun	CEDAC	
104	Mr. Hak Lieap	MLUP BAI TONG	
105	Mr. Nhem Kimteng	Monk /Sante Sena	
106	Mr. Phoeung Nady	JVC	
107	Mr. Chim Choa	APDO/UNV Siem reap	063 964.087
108	Mr. John Stellwagen	CDC-DANIDA	
109	Mr. Phum Phavath	BDASE Pursat	012 866.450
110	Mr. Jens Aare Olsen	ITSP (DANIDA)	
111	Mr. Kong Bunna	MCC	
112	Mr. Seng Ropichack	SL	
113	Mr. Leng Sothat	Padek	023 216.224
114	Mr. Ben Hammond	CARERE Pursat	
115	?		
116	?		
117	?		

## Annex 7.2 List of participants to groups

National Workshop on Priority Species from 15 to 16 August 2000, Juliana Hotel

Group I		Group II		Group III		Group IV		Group V	
N <sup>o</sup>	Name of Participants	N <sup>o</sup>	Name of Participat.	N <sup>o</sup>	Name of Participants	N <sup>o</sup>	Name of Participat.	N <sup>o</sup>	Name of Participant.
1	Mr. Kengo Yoshida	1	Mr.Sp Khan Rithikun	1	Mr. Kok TaraVuth	1	Mr. Hong Darith	1	Mr. Kong Bunna
2	-Bruno Cammaert	2	- Boeuy Phal	2	- An Dara	2	- Chhun Chheang	2	- Seng Ropichak
3	-Jurgen Fichtenau	3	- Phan Phoeun	3	- Chan Tak	3	- Nou Vandy	3	- Sors Pinarak
4	-ReyNadol Buendia	4	Mrs Im Maredi	4	- Thong Salim	4	- Srey Marona	4	- Kim Sarin
5	- Sour Hay	5	Mr Tep Samay	5	- Mark Vanny	5	- Hot Sothea	5	- Sou Sontara
6	- Kheng Bun Teun	6	- Pich Nerong	6	- Piel Piseth	6	- Hong Phea	6	- Seng Sitarun
7	- Min Bunnara	7	- Nhek Sonnary	7	- Ms Dany	7	- You Vey	7	-Nourn Povrathana
8	- Kol Sovann	8	- Loa Sethaphal	8	- Noy Samol	8	- Eth Phoumrea	8	- Kong Pouthira
9	- Chan Chesda	9	- Noth Uthvanheng	9	- Khun Bunnath	9	- Tea Kimsoth	9	- Ly Eingsov
10	- Chourng Sara	10	- Tang Che	10	- Kheiv Chantheavy	10	- Dornng Socheat	10	- Peng My
11	- Roeung Sophat	11	- Sourn Som	11	- Sim Samoeun	11	- Ly Choubeang	11	- Chea Buntha
12	- Hem Sophat	12	- Touch Bun Heng	12	- Toan Hao	12	- Pou Vannarith	12	- Hor Dara
13	- Phet Phaynong	13	- Yon Yokvorith	13	- Ben Hammond	13	- Leov BuThon	13	- Chay Kimsrun
14	- Yann Kimhorn	14	- Pov Sormanak	14	- Nop Sohtea	14	- Hun Eeing	14	- Kun Monira
15	- Chay Chetha	15	- So Than	15	- Y Chheang Meng	15	- Kruey Timeang	15	- Zhao Shumeng
16	- Sor ro	16	- Khan Kannha	16	- Sean Srun	16	- Hak Sokleap	16	- You kanvimean
17	- Kit Bunna	17	- Hak SaRum	17	- Sorun Bunthan	17	- Nhem Kimteing	17	- Som Khanrith
18	- Vong Sarun	18	- Phong Sela	18	- Koa Sengkry	18	- Phoeung Nady	18	- Ke Phonkherith
19	- Chan Sophal	19	- Kov Vutha	19	- Hong Kimhean	19	- Chim Chov	19	- Em Mony
20	- Chhang Phourin	20	Ms Lim Sopheap			20	- John Stellwagen	20	- Touch Mony
21	- Seng Ropichak	21	Mr Meak Vuthy			21	- Phum Phavat	21	- Pe Kuyheng
22	- Leng Sitho					22	-Lourng Chatanaroth	22	- Leng Sothat
23	Ms Vong Sopanha							23	- Long Bong

**Annex 8. List of categories of trees in Cambodia**

**General Categories of Tree Species in Cambodia**

<b><u>Work Group &gt; Categories</u></b>	<b>Group 1</b>	<b>Group 2</b>	<b>Group 3</b>	<b>Group 4</b>	<b>Group 5</b>	<b>Cambodian Combination: Workshop Result</b>
<b>A</b>	Industrial /Commercial	Industrial	Industrial	Industrial	Industrial	<i>Industrial Wood Use</i>
<b>B</b>	Community Wood Use	Community Wood Use	Rehabilitation	Protection	Fuel Wood	<i>Local Wood Use</i>
<b>C</b>	Protection Areas	Water Shad	Water Shad	Fuel Wood	Furniture	<i>Non-Timber Use</i>
<b>D</b>	Endangered	Erosion Control	Community Wood Use	Fruits	Water Shad	<i>Endangered Species</i>
<b>E</b>	Eco-Tourism Development	Rehabilitation	Wood energy	Ornamental /Road	Soil Improvement	
<b>F</b>			Medicine	Degraded Areas	Multi Purpose	
			Coastal	Agro-Forestry	Ornamental	
			Wildlife	Conservation	Agro-forestry	
			Fodder	Biodiversity		



## Ranking of Timber Wood Qualities in Cambodia

This is additional information not dealt with during the workshop but is according to Decision number 050 dated 12th August 1986 on classification of wood qualities and allowed minimum DBH (in cm) when cutting.

<i>N°</i>	<i>Cambodian Name</i>	<i>Scientific Name (French source)</i>	<i>DBH (cm)</i>
<b>Luxury Species (First Quality)</b>			
1	Ang kanh	Cassia siamea, Caesalpinaeae	45
2	Angkat Khmao	Diospyros bejaudi, Ebenaceae	45
3	Beng	Pahudia Cochinchinensis, Caesalpinaeae or Afzelia cochinchinensis	45
4	Chheu khmav	Diospyros sp., Ebenaceae	45
5	Cheung chap	Dasymachalon lamentaceum, Anonaceae	45
6	Chress	Albizzia lebbek, Mimoseae	45
7	Haisan or Chansor	Cassia garretiana, Caesalpinaeae	45
8	Hundang or Mrasprao phnum	Disoxylon Loureiri, Meliaceae	45
9	Kra nhoung	Dalbergia cochinchinensis, Papilionaceae	45
10	Kreul	Melanorrhoea laccifera, Anacardiaceae	45
11	Neang Nuon	Dalbergia bariensis, Papilionaceae	48
12	Tatrav	Fagraea fragrans, Loganiaceae	45
13	Thnong	Pterocarpus pedatus, Papilionaceae	45
14	Trar Yeang	Diospyros helferi, Ebenaceae	45
<b>First Quality Species</b>			
1	Beleuy	Lisea veng, Lauraceae	45
2	Bosneak	Mesua ferrea, Guttiferes	30
3	Daunchem	Tarrietia javanica, Sterculiaceae	45
4	Kes	Manikora alexandra, Sapotaceae	50
5	Kokidek	Hopea helfera, Dipterocarpaceae	50
6	Kokimsav	Hopea odorata, Dipterocarpaceae	50
7	Kokithmor	Hopea ferrea, Dipterocarpaceae	50
8	Kokoh	Sindora cochinchinensis, Caesalpinaeae	45
9	Krolanh	Dialium cochinchinensis, Caesalpinaeae	45
10	Maysak	Tectona grandis, Verbenaceae	45
11	Phchek	Shorea obtusa, Dipterocarpaceae	45
12	Phkai Proeuk	Afzelia bijuga, Caesalpinaeae	50
13	Popel	Hopea recopei, Dipterocarpaceae	45
14	Popoul or Phnel	Vitex sp., Verbenaceae	45
15	Raing Phnom	Pentacme Siamensis, Dipterocarpaceae	35
16	Sampor	Artocarpus sempervirens, Urticaceae	35
17	Angkatthmat	Stereospermum chaloneaides, Bignonaceae	45
18	Sdey	Crudia chrysantha, Caesalpinaeae	30
19	Sokram	Xylia dolabriformis, Mimoseae	45
20	Sralao or Enthanel	Lagerstroemia sp., Lythraceae	35
21	Sme	Ceriops roxburghiana, Rhizophoraceae	45
22	Trosek/ Tramkong	Peltophorum ferrugineum, Caesalpinaeae	35
23	Treal	Peltophorum dasyrachis, Caesalpinaeae	35
24	Voryorng	Chukrasia tabularis, Meliaceae	60

25	Chhlik	<i>Terminalia tomentosa</i> , Combretacees	45
<b>Second Quality Species</b>			
1	Atit or Neang Phoek	<i>Hassia cuneata</i> , Lauracees	45
2	ChhamChha	<i>Toona febrifuga</i> , Meliacees	30
3	Chheuteal bangkuoy or Neang deng	<i>Dipterocarpus costatus</i> , Dipterocarpacees	60
4	Chheuteal chhngo	<i>Dipterocarpus dyeri</i> , Dipterocarpacees	60
5	Chheuteal teuk	<i>Dipterocarpus alatus</i> , Dipterocarpacees	60
6	Chheuteal preng	<i>Dipterocarpus jourdainii</i> , Dipterocarpacees	60
7	Chorchong	<i>Shorea vulgaris</i> , Dipterocarpacees	60
8	Chramas	<i>Vatica astrotricha</i> , Dipterocarpacees	30
9	Khlong	<i>Dipterocarpus tuberculatus</i> , Dipterocarpacees	50
10	Khtiaou	<i>Shorea thorelli</i> , Dipterocarpacees	45
11	Koki khsach	<i>Hopea pierrei</i> , Dipterocarpacees	45
12	Kokipnong	<i>Shorea hypochra</i> , Dipterocarpacees	45
13	Lumbor	<i>Shorea sp.</i> , Dipterocarpacees	45
14	Phdeak	<i>Anisoptera glabra</i> , Dipterocarpacees	45
15	Srokom	<i>Payena elliptica</i> , Sapotacees	30
16	Sral Sleukpi	<i>Pinus merkusii</i> , Pinacees	45
17	Srolsor	<i>Podocarpus cupressina</i> , Podocarpacees	45
18	Srolkraham	<i>Decrydium elatum</i> , Podocarpacees	45
19	Theng	<i>Dipterocarpus obtusifolous</i> , Dipterocarpacees	45
20	Totimprey	?	
21	Trach	<i>Dipterocarpus intricatus</i> , Dipterocarpacees	50
22	Trolat	<i>Vatica philastreana</i> , Dipterocarpacees	30
23	Khvao	<i>Adina cordirolia</i> , Rubiacees	45
<b>Third Quality Species</b>			
1	Ataing or Rotaing	<i>Homalium annamensis</i> , Samydacees	35
2	Chan Krasna	<i>Aquilaria crasna</i> , Thymeliacees	35
3	Chan Tumpaing	<i>Sterculia campanulata</i> , Sterculiacees	45
4	Bangkav	<i>Aglaia gigantia</i> , Meliacees	35
5	Chektuom	<i>Cinnamomum litsaefolium</i> , Lauracees	30
6	Changourtmat	?	45
7	Kandol	<i>Careya sphaerica</i> , Myrtacees	45
8	Kdol	<i>Sarcocephalus cordatus</i> , Rubiacees	30
9	Khnor prey	<i>Artocarpus chaphasha</i> Roxb, Moracees	45
10	Khtoeung	<i>Calophyllum saigonensis</i> , guttiferes	30
11	Kampingreach	<i>Sandoricum indicum</i> , Meliacees	45
12	Korngkang	<i>Rhizophora sp.</i>	30
13	Krorbav	<i>Hydnocarpus anthelmitica</i> , Flacourtiacees	30
14	Kraysor	<i>Albizzia thorelli</i> , Mimosees	30
15	Kras	<i>Kayea engeniafolia</i> , Guttiferes	30
16	Longieng	<i>Cratoxylon prunifolium</i> , Hypericacees	30
17	Pramdamloeung	<i>Terminalia mucronata</i> , Combretacees	40
18	Phaong	<i>Callophyllum sp.</i> , Guttiferes	30
19	Pring	<i>Eugenia sp.</i> , Myrtacees	30
20	Prous	<i>Garcinia ferrea</i> , Guttiferes	30
21	Sam Poug	<i>Tetrameles nudiflora</i> , Daticacees	60
22	Smakrabey	<i>Knema cortocosa</i> , Myristicacees	45

23	Smach	Melaleuca leucadendron, Myrtacees	30
24	Svayprey	Mangifera indica, Anacardiacees	45
25	Taoru	Terminalia chebula, Combretacees	45
26	Thlork	Parinarium annamensis, Rosacees	45
27	Tramoung	Garcinia schomburghiana, Guttiferes	45
28	Tra meng	Carallia lucida, Rhizophoracees	45
29	Traptuom	Crypteronia paniculata, Lythracees	30
30	Bay pou vaing	?	30
31	Svay cham rieng	Swintonia pierri, Anacardiacees	45

## Annex 9. Priority tree species lists from each group

### Group's Ranking of Priorities Tree Species for Cambodia Group No. 1

#### I- Industrial Wood Species:

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Chheu teal teuk	<i>Dipterocarpus alatus</i> Roxb	Dipterocarpaceae	1
2	Chheu teal bangkuoy	<i>Dipterocarpus costatus</i> Gaertner.f.	Dipterocarpaceae	2
3	Phdeak	<i>Anisoptera costata</i> Kort	Dipterocarpaceae	3
4	Lumbor	<i>Shorea hypochrea</i> Hance	Dipterocarpaceae	4
5	Koki msav	<i>Hopea odorata</i> Roxb	Dipterocarpaceae	5
6	Chor chong	<i>Shorea vulgaris</i> Pierre	Dipterocarpaceae	6
7	Daun chem	<i>Tarrietia javanica</i> Blume	Sterculiaceae	7
8	Sral sleuk pi	<i>Pinus merkusii</i> Jungh et de Vries	Pinaceae	8
9	May sac	<i>Tectona grandis</i> L.	Verbenaceae	9
10	Po pel	<i>Shorea cochinchinensis</i> Pierre	Dipterocarpaceae	10

#### II- Community / Local Use Wood Species:

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Kanthum thet	<i>Leucaena leucocephala</i> (Lamk) de Wit	Mimosaceae	1
2	Ang kear day	<i>Sesbania grandiflora</i> Pers	Papilionaceae	2
3	Ang kanh	<i>Cassia siamea</i> Lam	Caesalpiniaceae	3
4	Acacia sleuk tauch	<i>Acacia auriculiformis</i> Muell	Mimosaceae	4
5	Preng kyal	<i>Eucalyptus camadulensis</i> Dehnh	Myrtaceae	5
6	Korng kang	<i>Rhizophora</i> sp	Rhizophoraceae	6
7	Tbaing	<i>Dipterocarpus obtusifolius</i> Teysm	Dipterocarpaceae	7
8	Sdav	<i>Azadirachta indica</i> Juss .f.	Meliaceae	8
9	Am pil	<i>Tamarindus indica</i> L .Me	Caesalpiniaceae	9
10	Sang kai	<i>Combretum quadrangulare</i> Kurz	Combretaceae	10
11	Khlong	<i>Dipterocarpus tuberculatus</i> Roxb	Dipterocarpaceae	11
12	Tra sek	<i>Peltophorum ferrugineum</i> Benth	Caesalpiniaceae	12

### III- Non-timber Products Species:

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Sdav	<i>Azadirachta indica</i> Juss .f.	Meliaceae	1
2	Kngork	<i>Delonix regia</i> (Boj) Raf.	Caesalpiniaceae	2
3	Trabaik prey	<i>Lagerstroemia floribunda</i> Jack	Lythraceae	3
4	Mrum	<i>Moringa oleifera</i> Lamk	Moringaceae	4
5	Chann krasna	<i>Aquilaria crassna</i> Pierre	Thymeleaceae	5
6	Reussey srok	<i>Bambousa arundinacea</i> (Retz) Willd	Poaceae	6
7	Sam rang	<i>Sterculia lychnophora</i> (Hance.) Kost	Sterculiaceae	7
8	Kra vanh	<i>Amomum krevanh</i> Pierre	Zingiberaceae	8
9	Vor romuorl pleung			9
10	Kan dorl	<i>Careya sphaerica</i> Roxb	Lecythidaceae	10

### IV- Endangered Species:

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Chann krasna	<i>Aquilaria crassna</i> Pierre	Thymeleaceae	1
2	Chheu khmaov	<i>Diospyros crumenata</i> Thw	Ebenaceae	2
3	Neang noun	<i>Dalbergia bariensis</i> Pierre	Papilionaceae	3
4	Beng	<i>Azalia xylocarpa</i> (Kurz) Craib	Caesalpiniaceae	4
5	Chheu phleung	<i>Diospyros nitida</i> Merr	Ebenaceae	5
6	Kra gnoug	<i>Dalbergia cochinchinensis</i> Pierre	Papilionaceae	6
7	Ta trav	<i>Fagraea fragans</i> Pit	Loganiaceae	7
8	Day khla	<i>Gardenia ankoriensis</i> Pit	Rubiaceae	8
9	Cheung chap phnom	<i>Dasymachalon lamentaceum</i> Fin et Gagn	Annonaceae	9
10	Mras prov phnom	<i>Disoxylon loureiri</i>	Meliaceae	10
11	Ang kat khmoav	<i>Diospyros bejaudii</i> Lecomte	Ebenaceae	11

**Ranking Priority Tree Species  
Group II**

**I- Industrial Wood Species:**

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Phdeark	Anisoptera costata Kort	Dipterocarpaceae	1
2	Chheu teal teuk	Dipterocarpus alatus Roxb	Dipterocarpaceae	2
3	Chheu teal bang koury	Dipterocarpus costatus Gaertner.f.	Dipterocarpaceae	3
4	Chheu teal preng	Dipterocarpus turbinatus Gaertner.f.	Dipterocarpaceae	4
5	Sral sleuk pi	Pinus merkusii Jungh et de Vrien	Pinaceae	5
6	Chor chong	Shorea vulgaris Pierre	Dipterocarpaceae	6
7	Tnung kraham	Pterocarpus pedatus Pierre	Papilionaceae	7
8	Daun chem	Tarrietia javanica Blume	Sterculiaceae	8
9	May sac	Tectona grandis L .f.	Verbenaceae	9
10	Acacia sleuk tauch	Acacia auriculiformis Muell	Mimosaceae	10

**II - Community / Local Use Wood Species:**

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Korki msav	Hopea odorata Roxb	Dipterocarpaceae	1
2	Ang kanh	Cassia siamea Lam	Caesalpiaceae	2
3	Trach	Dipterocarpus intricatus Dyer	Dipterocarpaceae	3
4	Smach	Melaleuca lecadendron (L). L.	Myrtaceae	4
5	Korng kang	Rhizophora sp	Rhizophoraceae	5
6	Tra sek	Peltophorum ferrugineum Benth	Caesalpiaceae	6
7	Kra lanh	Dialium cochinchinensis	Caesalpiaceae	7
8	Sra laov	Lagestroemia ovalifolia Teijsm et Binn	Lythraceae	8
9	Kor koh	Sindora cochinchinensis H.Baill	Caesalpiaceae	9
10	Kvav	Adina cordifolia Hook .f.	Rubiaceae	10

### III- Non-timber Products Species:

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Kroeul	Melanorrhoea laccifera Pierre	Anacardiaceae	1
2	Porpel	Shorea cochinchinensis Pierre	Dipterocarpaceae	2
3	Sdav	Azadirachta indica Juss .f.	Meliaceae	3
4	Chann krasna	Aquilaria crassna Pierre	Thymeleaceae	4
5	Tepirou	Cinnamomum cambodianum H.	Lauraceae	5
6	Sam rang	Sterculia lychnophora Hance	Sterculiaceae	6
7	Prah pnaov	Terminalia nigrovenulosa Pierre in Lan	Combretaceae	7
8	Ang kear day	Sesbania grandiflora Pers	Papilionaceae	8
9	Kanthum thet	Leucoena lecocephala (Lamk) de Wit	Mimosaceae	9

### IV- Endangered Species:

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Ta trav	Fagraea fragans Pit	Loganiaceae	1
2	Chheu khmaov	Diospyros crumenata Thw	Ebenaceae	2
3	Neang nuon	Dalbergia bariensis Pierre	Papilionaceae	3
4	Beng	Azalia xylocarpa (Kurz) Craib	Caesalpiniaceae	4
5	Kra gnoung	Dalbergia cochinchinensis Pierre	Papilionaceae	5
6	Tnoung sar	Pterocarpus cambodianus Pierre	Papilionaceae	6
7	Day khla	Gardenia ankoriensis Pit	Rubiaceae	7
8	Chres	Albizzia lebek (L) Benth	Mimosaceae	8
9	Ang kat khmaov	Diospyros bejardii Lecomte	Ebenaceae	9
10	Hay san	Cassia garretiana Craib	Caesalpiniaceae	10

**Ranking of priorities species for Cambodia  
Group III**

**I- Industrial Wood Species:**

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Chheu teal teuk	<i>Dipterocarpus alatus</i> Roxb	Dipterocarpaceae	1
2	Phdeak	<i>Anisoptera costata</i> Kort	Dipterocarpaceae	2
3	Korki msaov	<i>Hopea odorata</i> Roxb	Dipterocarpaceae	3
4	Sral sleuk pi	<i>Pinus merkusii</i> Jungh et de Vries	Pinaceae	4
5	Acacia sleuk tauch	<i>Acacia auriculiformis</i> Muell	Mimosaceae	5
6	May sac	<i>Tectona grandis</i> L.	Verbenaceae	6
7	Daun chem	<i>Tarrietia javanica</i> Blume	Sterculiaceae	7

**II - Community / Local Use Wood Species:**

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Sdaov	<i>Azadirachta indica</i> Juss .f.	Meliaceae	1
2	Ang kanh	<i>Cassia siamea</i> Lam	Caesalpinaceae	2
3	Chres	<i>Albizia lebek</i> (L) Benth	Mimosaceae	3
4	Acacia sleuk tauch	<i>Acacia auriculiformis</i> Muell	Mimosaceae	4
5	Ang kear day	<i>Sesbania grandiflora</i> Pers.	Papilionaceae	5
6	Kan thum thet	<i>Leucoena leucocephala</i> (Lamk) de Wit	Mimosaceae	6
7	Chann kiri	<i>Samanea saman</i> ( Jacq ) Merr	Mimosaceae	7
8	Preng kyal	<i>Eucalyptus camadulensis</i> Dehnh	Myrtaceae	8
9	Mrum	<i>Moringa oleifera</i> Lamk	Moringaceae	9



### III- Non-timber Products Species:

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Pdaov	Calamus sp. (Rotan)	Palmae	1
2	Russey	Bambousa arandinacea Retz	Paceae	2
3	Tumpeang bay chou prey	Ampelocissus arachnoidea Planch	Vitaceae	3
4	Smach	Melaleuca lecadendron (L). L.	Myrtaceae	4
5	Tmear	Acacia intsii	Mimosaceae	5
6	Phlou	Dillenia ovata Wall	Dilleniaceae	6
7	Srar mar	Terminalia chebula Roxb	Combretaceae	7
8	Mdenh	Alpinia officinaricum	Zingiberaceae	8
9	Sam rang	Sterculia lychnophora Hance	Sterculiaceae	9
10	Pcheuk	Shorea obtusa Wall	Dipterocarpaceae	10
11	Kreul	Melanorrhoea laccifera Pierre	Anacardiaceae	11
12	Chheu teal teuk	Dipterocarpus alatus Roxb	Dipterocarpaceae	12

### IV- Endangered Species:

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Chann krasna	Aquilaria crassna Pierre	Thymeleaceae	1
2	Neang nuon	Dalbergia bariensis Pierre	Papilionaceae	2
3	Beng	Azelia xylocarpa (Kurz) Craib	Caesalpiniaceae	3
4	Kra gnoung	Dalbergia cochinchinensis Pierre	Papilionaceae	4
5	Thnong	Pterocarpus pedatus Pierre	Papilionaceae	5
6	Day khla	Gardenia ankoriensis Pit	Rubiaceae	6
7	Ta trav	Fagraea fragans Pit	Loganiaceae	7
8	Ang kat khmaov	Diospyros bejaudii Lecomte	Ebenaceae	8
9	Mras prov phnom	Disoxylon loureiri	Meliaceae	9
10	Korki thmar	Hopea ferrea	Dipterocarpaceae	10
11	Chheu khmaov	Diospyros crumenata Thw	Ebenaceae	11

**Ranking of Priorities Tree Species  
Group IV**

**I - Industrial Wood Species:**

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Phdeak	<i>Anisoptera costata</i> Kort	Dipterocarpaceae	1
2	Chheu teal bangkuoy	<i>Dipterocarpus costatus</i> Gaertner.f.	Dipterocarpaceae	2
3	Chor chong	<i>Shorea vulgaris</i> Pierre	Dipterocarpaceae	3
4	Daun chem	<i>Tarrietia javanica</i> Blume	Sterculiaceae	4
5	May sac	<i>Tectona grandis</i> L.	Verbenaceae	5
6	Sral sleuk pi	<i>Pinus merkusii</i> Jungh et de Vries	Pinaceae	6
7	Korki msaov	<i>Hopea odorata</i> Roxb	Dipterocarpaceae	7
8	Thnong sar	<i>Pterocarpus cambodianus</i> Pierre	Papilionaceae	8
9	Beng	<i>Azelia xylocarpa</i> (Kurz) Craib	Caesalpiniaceae	9
10	Acacia sleuk tauch	<i>Acacia auriculiformis</i> Muell	Mimosaceae	10

**II- Community / Local Use Wood Species:**

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Acacia sleuk tauch	<i>Acacia auriculiformis</i> Muell	Mimosaceae	1
2	Ang kear day	<i>Sesbania grandiflora</i> Pers.	Papilionaceae	2
3	Ang kanh	<i>Cassia siamea</i> Lam	Caesalpiniaceae	3
4	Sdaov	<i>Azadirachta indica</i> Juss .f.	Meliaceae	4
5	Sang kai	<i>Combretum quadrangulare</i> Kurz	Combretaceae	5
6	Kanthum thet	<i>Leucoena lecocephala</i> (Lamk) de Wit	Mimosaceae	6
7	Chann kiri	<i>Samanea saman</i> (Jacq) Merr	Mimosaceae	7
8	Kroab baik	<i>Khaya senegalensis</i>	Meliaceae	8
9	Pring	<i>Eugenia jambolana</i>	Myrtaceae	9
10	Trar sek	<i>Peltophorum ferrugineum</i> Benth	Caesalpiniaceae	10

### III- Non-timber Product Species:

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Russey	Bambousa arandinacea Retz	Paceae	1
2	Kou len	Litchi sinensis Radlk	Sapindaceae	2
3	Se moarn	Nephelium xerospermum	Sapindaceae	3
4	Sam rorng	Sterculia lychnophora (Hance.) Kost	Sterculiaceae	4
5	Kamping reach	Sandoricum indicum Cav.	Meliaceae	5
6	Phnoew	Aegle marmelos Correa	Rutaceae	6
7	Srar mar	Terminalia chebula Roxb	Combretaceae	7
8	Pdaov	Calamus sp. (Rotan)	Palmae	8
9	Tepirou	Cinnamomum cambodianum H.	Lauraceae	9
10	Kra vanh	Amomum krervanh Pierre	Zingiberaceae	10

### IV- Endangered Species:

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Chheu teal bangkuoy	Dipterocarpus costatus Gaertner.f.	Dipterocarpaceae	1
2	Phdeak	Anisoptera costata Kort	Dipterocarpaceae	2
3	Daun chaim	Tarrietia javanica Blume	Sterculiaceae	3
4	Beng	Afzelia xylocarpa (Kurz) Craib	Caesalpiniaceae	4
5	Neang nuon	Dalbergia bariensis Pierre	Papilionaceae	5
6	Kra gnoung	Dalbergia cochinchinensis Pierre	Papilionaceae	6
7	Sra laov	Lagestroemia ovalifolia Teijsm et Binn	Lythraceae	7
8	Por pel	Shorea cochinchinensis Pierre	Dipterocarpaceae	8
9	Chann krasna	Aquilaria crassna Pierre	Thymeleaceae	9
10	Korki msaov	Hopea odorata Roxb	Dipterocarpaceae	10
11	Thnong sar	Pterocarpus cambodianus Pierre	Papilionaceae	11

**Ranking of Priorities Tree Species for Cambodia  
Group V**

**I- Industrial Wood Species:**

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Phdeak	Anisoptera costata Kort	Dipterocarpaceae	1
2	Chheu teal teuk	Dipterocarpus alatus Roxb	Dipterocarpaceae	2
3	Daun chem	Tarrietia javanica Blume	Sterculiaceae	3
4	Korki msaov	Hopea odorata Roxb	Dipterocarpaceae	4
5	Sral sleuk pi	Pinus merkusii Jungh et de Vries	Pinaceae	5
6	May sac	Tectona grandis L.	Verbenaceae	6
7	Lum bor	Shorea hypochrea Hance	Dipterocarpaceae	7
8	Kar koh	Sindora cochinchinensis H.Baill	Caesalpiniaceae	8
9	Acacia sleuk tauch	Acacia auriculiformis Muell	Mimosaceae	9
10	Thnong chheam moarn	Pterocarpus cambodianus Pierre	Papilionaceae	
11	Thnong sar	Pterocarpus cambodianus Pierre	Papilionaceae	10

**II- Communities / Local Use Wood Species:**

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Kor koh	Sindora cochinchinensis H.Baill	Caesalpiniaceae	1
2	So krarm	Xylia dolabriformis Benth	Mimosaceae	2
3	Trach	Dipterocarpus intricatus Dyer	Dipterocarpaceae	3
4	Ta trav	Fagraea fragans Pit	Loganiaceae	4
5	Chra mass	Vatica astrotricha Hance	Dipterocarpaceae	5
6	Khvav	Adina cordifolia Hk.f.	Rubiaceae	6
7	Khnorl prey	Artocarpus chaphasha Roxb	Mosaceae	7
8	Ang kear day	Sesbania grandiflora Pers	Papilionaceae	8
9	Korng kang	Rhizophora sp	Rhizophoraceae	9
10	Smach	Melaleuca lecadendron (L). L.	Myrtaceae	10

### III- Non-timber Products Species:

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Sdav	<i>Azadirachta indica</i> Juss .f.	Meliaceae	1
2	Kra vanh	<i>Amomum krervanh</i> Pierre	Zingiberaceae	2
3	Kreul	<i>Melanorhea laccifera</i> Pierre	Anacardiaceae	3
4	Sam rang	<i>Sterculia lychnophora</i> (Hance.) Kost	Sterculiaceae	4
5	Chor chong	<i>Shorea vulgaris</i> Pierre	Dipterocarpaceae	5
6	Kamping reach	<i>Sandoricum indicum</i> Cav	Meliaceae	6
7	Srar mar	<i>Terminalia chebula</i> Roxb	Combretaceae	7
8	Slaing	<i>Strychnos nux-vomica</i>		8
9	Pdaov	<i>Calamus</i> sp (Rotan)	Palmae	9
10	Russey	<i>Bambousa drundinacea</i>	Poaceae	10

### IV- Endangered Species:

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Chann krasna	<i>Aquilaria crassna</i> Pierre	Thymeleaceae	1
2	Kra gnoung	<i>Dalbergia cochinchinensis</i> Pierre	Papilionaceae	2
3	Neang puon	<i>Dalbergia bariensis</i> Pierre	Papilionaceae	3
4	Beng	<i>Azalia xylocarpa</i> (Kurz) Craib	Caesalpiniaceae	4
5	Cheung chap	<i>Dasymachalon lamentaceum</i> Fin et Gagn	Annonaceae	5
6	Ang kat khmaov	<i>Diospyros bejoudii</i> Lecomte	Ebenaceae	6
7	Day khla	<i>Gardenia ankoriensis</i> Pit	Rubiaceae	7
8	Vor romeat	?		8
9	Bak darng	<i>Gardenia ankoriensis</i> Pitard	Rubiaceae	9
10	Mrass prov phnom	<i>Disoxylon loureiri</i>	Meliaceae	10

## Annex 10. Ranking of trees

### National Ranking of Priority Trees for Cambodia. (Arithmetic result of combining all five group's lists)

#### I - Industrial Wood Species

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Phdeak	<i>Anisoptera costata</i> Kort	Dipterocarpaceae	1
2	Chheuteal teuk	<i>Dipterocarpus alatus</i> Roxb.	Dipterocarpaceae	2
3	Chheuteal bangkuoy	<i>Dipterocarpus costatus</i> Gaertner f.	Dipterocarpaceae	3
4	Sral sleuk pi	<i>Pinus merkusii</i> Jungh. et de Vries	Pinaceae	4
5	Daunchem	<i>Terrietia javanica</i> Blume	Sterculiaceae	5
6	Koki msav	<i>Hopea odorata</i> Roxb.	Dipterocarpaceae	6
7	May sac	<i>Tectona grandis</i> L.f	Verbenaceae	7
8	Chor chong	<i>Shorea vulgaris</i> Pierre	Dipterocarpaceae	8
9	Lum bor	<i>Shorea hypochrea</i> Hance	Dipterocarpaceae	9
10	Acacia sleuk tauch	<i>Acacia auriculiformis</i> Muell	Mimosaceae	10
11	Chheuteal preng	<i>Dipterocarpus turbinatus</i> Gaertner f.	Dipterocarpaceae	11
12	Thnorng kraham	<i>Pterocarpus pedatus</i> Pierre	Papilionaceae	12
13	Thnorng sar	<i>Pterocarpus cambodianus</i> Pierre	Papilionaceae	13
14	Beng	<i>Azalia xylocarpa</i> (Kurz) Craib.	Caesalpiniaceae	14
15	Thnorng chheamoarn	<i>Pterocarpus macrocarpus</i> Kurz	Papilionaceae	15
16	Ko koh	<i>Sindora cochinchinensis</i> H.Baill	Caesalpiniaceae	16
17	Popel	<i>Shorea cochinchinensis</i> Pierre	Dipterocarpaceae	17

## National Ranking of Priority Trees for Cambodia

### II - Wood for Community / Local Use Species

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Ang kanh	<i>Cassia siamea</i> Lam.	Caesalpiniaceae	1
2	Angkear dey	<i>Sesbania grandisflora</i> (L)	Papilionaceae	2
3	Acacia sleuk tauch	<i>Acacia auriculiformis</i> Muell.	Mimosaceae	3
4	Sdav	<i>Azadirachta indica</i> Juss. f.	Meliaceae	4
5	Kanthumthet	<i>Leucoena lecocephala</i> (Lamk) de Wit	Mimosaceae	5
6	Trach	<i>Dipterocarpus intricatus</i> Dyer	Dipterocarpaceae	6
7	Korng kang	<i>Rhizophora</i> spp	Rhizophoraceae	7
8	Kor koh	<i>Sindora cochinchinensis</i> H.Baill.	Caesalpiniaceae	8
9	Korki msav	<i>Hopea odorata</i> Roxb.	Dipterocarpaceae	9
10	Preng kyal	<i>Eucalyptus camaldulensis</i> Dehnh.	Myrtaceae	10
11	So kram	<i>Xylia dolabriformis</i> Benth	Mimosaceae	11
12	Chress	<i>Albizzia lebek</i> (L.) Benth	Mimosaceae	12
13	Chann kiri	<i>Samanea saman</i> (Jacq.) Merr.	Mimosaceae	13
14	Smach	<i>Melaleuca leucadendron</i> (L.) L	Myrtaceae	14
15	Sangke	<i>Combretum quadrangulare</i> Kurz.	Combretaceae	15
16	Ta trav	<i>Fagraea fragrans</i> pit.	Loganiaceae	16
17	Chra mas	<i>Vatica astrotricha</i> Hance	Dipterocarpaceae	17
18	Trosek prey	<i>Peltophorum ferrugineum</i> Benth	Caesalpiniaceae	18
19	Kvav	<i>Anida cordifolia</i> Hook.f.	Rubiaceae	19
20	Kro lanh	<i>Dialium cochinchinensis</i>	Caesalpiniaceae	20
21	Tbeng	<i>Dipterocarpus obtusifolius</i> Teysm	Dipterocarpaceae	21
22	Knol prey	<i>Artocarpus altilis</i>	Moraceae	22
23	Kroabek	<i>Khaya senegalensis</i>	Meliaceae	23
24	Sra lao	<i>Lagerstroemia ovalifolia</i> Teijsm et Binn	Lythraceae	24
25	Am pil	<i>Tamarindus indica</i> L.Me	Caesalpiniaceae	25
26	Morum	<i>Moringa oleifera</i> Lamk	Moringaceae	26
27	Pring	<i>Eugenia Jambolana</i>	Myrtaceae	27
28	Khlong	<i>Dipterocarpus tuberculatus</i> Roxb	Dipterocarpaceae	28

## National Ranking of Priority Trees for Cambodia

### III - Non-Timber Products Species

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Sdav	<i>Azadirachta indica</i> Juss. f.	Meliaceae	1
2	Russey prey	<i>Bambosa arundinacea</i> (Retz.) Willd	Poaceae	2
3	Samrorng	<i>Sterculia lychnophora</i> Hance	Sterculiaceae	3
4	Kreul	<i>Melanorhea laccifera</i> Pierre	Anacardiaceae	4
5	Pdav	<i>Calamus</i> spp	Palmae	5
6	Kravanh	<i>Amomum krevanh</i> Pirre	Zingiberaceae	6
7	Chann krasna	<i>Aquilaria crassna</i> Pierre	Thymeleaceae	7
9	Kamping reach	<i>Sandoricum indicum</i> Cav.	Meliaceae	9
8	Sra mar	<i>Terminalia chebula</i> Roxb.	Combretaceae	8
10	Kngaok	<i>Delonix regia</i> (Boj) Raf.	Caesalpinaceae	10
11	Kou len	<i>Litchi sinensis</i> Radlk.	Sapindaceae	11
12	Porpel	<i>Shorea cochinchinensis</i> Pierre	Dipterocarpaceae	12
13	Tepirou	<i>Cinnamomum cambodianum</i> H.	Lauraceae	13
14	Tumpaing baychou prey	<i>Ampelocissus arachnoidea</i> Planch.	Vitaceae	14
15	Trabek prey	<i>Lagerstroemia floribunda</i> Jack	Lythraceae	15
16	Se mornn	<i>Nephelium xerospermum</i>	Sapindaceae	16
17	Chor chong	<i>Shorea vulgaris</i> Pierre	Dipterocarpaceae	17
18	Smach	<i>Melaleuca leucadendron</i> (L.). L.	Myrtaceae	18
19	Morum	<i>Moringa oleifera</i> Lamk	Moringaceae	19
20	Thmear	<i>Acacia intsii</i>	Mimosaceae	20
21	Phnao	<i>Aegle marmelos</i> Correa	Rutaceae	21
22	Phlou	<i>Dillenia ovata</i> Wall	Dilleniaceae	22
23	Preah phnao	<i>Terminalia negrovenulosa</i> Pierre in Lam	Combretaceae	23
24	Angkear dey	<i>Sesbania grandiflora</i> (L )	Papilionaceae	24
25	Sleng	?		25
26	Mdeinh	<i>Alpinia officinaricum</i>	Zingiberaceae	26
27	Kanthum thet	<i>Leucoena leucocephala</i> (Lamk) de Wit	Mimosaceae	27
28	Chheuteal teuk	<i>Dipterocarpus alatus</i> Roxb	Dipterocarpaceae	28



## National Ranking of Priority Trees for Cambodia

### IV - Endangered or Rare Species

No	Khmer Name	Scientific Name		Priority
		Species	Family	
1	Neang nuon	<i>Dalbergia bariensis</i> Pierre	Papilionaceae	1
2	Chann krasna	<i>Aquilaria crassna</i> Pierre	Thymeleaceae	2
3	Beng	<i>Azalia xylocarpa</i> (Kurz) Craib.	Caesalpiniaceae	3
4	Kra nhoung	<i>Dalbergia cochinchinensis</i> Pierre	Papilionaceae	4
5	Chheu khmav	<i>Diospyros crumenata</i> Thwaites	Ebenaceae	5
6	Ta trav	<i>Fagraea fragrans</i> pit.	Loganiaceae	6
7	Day khla	<i>Gardenia ankoriensis</i> Pit.	Rubiaceae	7
8	Chheu phleung	<i>Diospyros nitida</i> Merr.	Ebenaceae	8
9	Thnorng	<i>Pterocarpus</i> spp	Papilionaceae	9
10	Angkat khmao	<i>Diospyros bejaudi</i> Lecomte	Ebenaceae	10
11	Chheuteal teuk	<i>Dipterocarpus alatus</i> Pierre	Dipterocarpaceae	11
12	Phdeak	<i>Anisoptera costata</i> Korth	Dipterocarpaceae	12
13	Daun chem	<i>Terrietia javanica</i> Blume	Sterculiaceae	13
14	Cheungchap phnom	<i>Dasymachalon lamentaceum</i> Fint et Gagn	Annonaceae	14
15	Sralao	<i>Lagerstroemia</i> sp.	Lythraceae	15
16	Kra nhoung	<i>Dalbergia cochinchinensis</i> Pirre	Papilionaceae	16
17	Mrasprao phnom	<i>Disoxylon loureiri</i>	Meliaceae	17
18	Chres	<i>Albizia lebek</i> (L) Benth	Mimosaceae	18
19	Popel	<i>Shorea cochinchinensis</i> Pirre	Dipterocarpaceae	19
20	Bak dong	<i>Gardenia angkoriensis</i>	Rubiaceae	20
21	Koki msav	<i>Hopea odorata</i> Roxb.	Dipterocarpaceae	21
22	Voromeat	?		22
23	Haisan	<i>Cassia garretiana</i> Craib	Caesalpiniaceae	23
24	Koki thmor	<i>Hopea ferrea</i>	Dipterocarpaceae	24

## Annex 11. Recommendations of groups as to follow-up by CTSP / MAFF / DFW / RGC

### Recommendations from group discussions

Group	Human resource development	Seed Procurement	Indigenous species conservation	Technology development
I	<ul style="list-style-type: none"> <li>Conduct training courses</li> <li>Provide scholarships</li> </ul>	<ul style="list-style-type: none"> <li>Advise on seed collection techniques</li> <li>Open workshop on tree seed</li> <li>Rehabilitation of infrastructure</li> <li>Support to seed policy</li> </ul>	<ul style="list-style-type: none"> <li>Request selective tree seed priorities</li> </ul>	<ul style="list-style-type: none"> <li>Technological development on seed supply</li> <li>Establishment seed laboratory and provide equipment to regions (Provinces?)</li> <li>Open regional workshop on seed techniques.</li> </ul>
II	<ul style="list-style-type: none"> <li>Training course for short and long time.</li> <li>Visit and study tours</li> </ul>	<ul style="list-style-type: none"> <li>Identify tree seed sources</li> <li>Establishment of tree seed center in Cambodia.</li> </ul>	<ul style="list-style-type: none"> <li>Seed storage</li> <li>Gene resource conservation of species</li> <li>Wood use in exploitation</li> <li>Conservation</li> </ul>	<ul style="list-style-type: none"> <li>Provide modern techniques</li> <li>Install equipment</li> <li>Create seed sources</li> <li>Extension on:                             <ul style="list-style-type: none"> <li>Seed</li> <li>Nursery technique</li> </ul> </li> <li>Certificated seed source with clear documentation.</li> </ul>
III	<ul style="list-style-type: none"> <li>Provide seed procurement Adviser</li> <li>Short training skill course from 1 week to 1 year</li> <li>Long training skill course from 2 year to 3 years</li> <li>Experiential exchange through study tours</li> <li>Local workshop on the seed for increasing the knowledge of the local people</li> </ul>	<ul style="list-style-type: none"> <li>Need tree seed of short rotation and long rotation species.</li> <li>Need a seed storage</li> <li>Must have experimental plots</li> </ul>	<ul style="list-style-type: none"> <li>Must have the principle of conservation of Indigenous Species.</li> <li>Identify areas for tree seed conservation</li> </ul>	<ul style="list-style-type: none"> <li>Provide technical documents</li> <li>Providing equipment for seed laboratory</li> <li>Establish Internet system.</li> </ul>
IV	<ul style="list-style-type: none"> <li>Lack of technical seed procurement</li> <li>Train for short time</li> <li>Train for long time (Ph.D., M.Sc.)</li> </ul>	<ul style="list-style-type: none"> <li>To collect and select?</li> <li>Seed stocking</li> </ul>	<ul style="list-style-type: none"> <li>Afraid lose the mother trees</li> <li>Increasing wood use but the knowledge of the people is limited</li> <li>Economic and social problems</li> </ul>	<ul style="list-style-type: none"> <li>Need document of seed</li> <li>Need equipment for seed work</li> <li>Identify civilization?</li> <li>Methodology of germinations</li> </ul>
V	<ul style="list-style-type: none"> <li>Train for short time</li> <li>Study tour</li> <li>Train for seed work</li> <li>Long time training</li> <li>Open workshop</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of seed center</li> <li>Provide study equipment</li> <li>Create seed stock on provincial level</li> </ul>	<ul style="list-style-type: none"> <li>Research for priority indigenous species.</li> <li>Providing strategy and policy</li> <li>Supporting</li> </ul>	<ul style="list-style-type: none"> <li>Providing documents</li> <li>Providing equipment for seed laboratory</li> <li>Install Internet system.</li> </ul>

## **Annex 12. Concluding remarks for Mr. Ty Sokhun, Director General of Forests**

Closing remarks of Mr. Chea Sam Ang  
Deputy Director of Department of Forestry and Wildlife  
The Closing of Workshop on Priority Tree Species  
August 16th, 2000  
Hotel Juliana, Phnom Penh

- Your Excellency Nherm Kim Teng (Buddhist monk)
- H.E Chan Sarun, Under Secretary of State for the MAFF, Advisor (in charge of forestry) to Prime Minister
- Jens Aare Olsen, Chief Technical Advisor for Indochina Tree Seed Programme, Danida
- Your Excellencies, Ladies, Gentlemen, Distinguished Guests and participants!

Today I have a great honor and sensation of enjoyment, as I am honorable guest in the closing of the Workshop on Priority Tree Species in Cambodia that has been held for two days and successfully so.

During the 2-days process of such an event, your excellency, ladies and gentlemen, consciously spent your time and efforts to discuss and exchange concepts and experiences in individual areas of expertise in order to identify issues and utilization of priority tree and define recommendations and strategies that are key for plantation of trees and reforestation as well as Conservation of Tree Gene Resources in Cambodia.

On behalf of the DFW, I would like to express my gratitude to Your Excellency, ladies and gentlemen in the closing of this workshop. Meanwhile I express my acknowledgement of the efforts of Your Excellency, Ladies and Gentlemen by contributing your value time taken away from your family to be present in the 2-days workshop.

Referring to the report made by the organizer of the workshop summing-up the output of the 2-days workshop, our participants discussed and shared ideas with each other in great detail and with high responsibility, and as the result reached solutions and gave recommendations that are applicable and adopted to the government's policy, economic principles and guidelines.

### *Major solutions:*

Strategy for conservation and use of gene resources of priority tree species:  
To promote and ensure the effective and efficient use of gene resources, embark on identification and selection of priority tree species based on the following principles:

- 1- Tree species to meet the demand of industrial purpose such as timbers for constructions, furniture, paper, boards and export.
- 2- Local wood species mainly supplying materials for fuel wood, poles, furniture, agricultural tools, and artwork.
- 3- Local non-wood species including fruits, bark, leaves, medicine, fodder, resin and fertilizer.
- 4- Endangered and indigenous species for conservation and enhancing biodiversity of protected areas.

Recommendations:

- 1- to enhance tree seed selection through identification of seed sources
- 2- to conserve genetic sources in-situ or through domestication, and to define locations and endangered species for conservation.
- 3- to procure seeds (collection, processing, storage and package) for the national requirements.
- 4- to develop guidelines and policies for collection, sale and utilization as following:
  - Documentation of seed sources
  - Documentation of seed lots and labeling (possibly certification rules and regulations)
  - System of seed zoning (a guide allowing for tree seed movement within ecological zones of the gene sources)
  - Replying to the solution and recommendation, DFW will highlight these by transferring the solution and recommendation into active practices in the near future.

Your Excellency, ladies and gentlemen I think that achievements of the workshop and the recommendations bring a significant output to the Nation and the Cambodian People. They also contribute economic, social and environmental benefits and sustainable use of natural resources.

Your Excellency, ladies and gentlemen, lastly I wish all of you a safe travel back home. Thank you.

**Annex 13. Closing remarks by H E Chan Sarun, Under Secretary of State (Forestry), MAFF**

Closing Speech of H.E. Chan Sarun  
Under Secretary of State and  
Advisor (in charge of Forestry) to Prime Minister  
The Closing of Workshop on Priority Tree Species  
16th August 2000

Your Excellency, ladies and gentlemen, distinguishes national and international guests. Today, on behalf of Ministry of Agriculture, Forestry and Fishery, and my self, I am so happy and proud and have a great honor in being invited to close the workshop on priority tree species. Outputs of the selection of priority tree species have been presented and I would like to share my expressions on the many achievements anticipated and planned in the workshop process.

The main objective of the national workshop is to discuss, consult and exchange knowledge, information and experiences gained from each local area of priority tree species and come up with recommendations to support and develop a strategy for provision of genetically suitable seed of good physiological quality to meet the needs for tree plantation activities in Cambodia.

From the summary of the workshop output, I assume the workshop highlights on trees being used currently and being endangered. It is suitably required for additional preparation to identify species as well as seed procurement to ensure the trees being grown are the best and adopted to meet the users demand. In addition to this, the workshop also defines priority tree species for protection and conservation. In general I observed that the recommendations are from comprehensive discussion and includes experiences of foresters, NGOs, representatives of logging concession firms and international organizations that have close relationship to the use of tree seeds and timbers and to tree plantations.

Your Excellency, ladies and gentlemen! From my point of view the recommendations gained from the workshop will be considered by MAFF and DFW and will be used to enact guidelines for defining areas of gene source conservation and tree seed production.

The two-day workshop has discussed and found out 96 seed priority species of which 17 are industrial wood species, 28 are local use and community wood species, 23 are non-wood species and 28 are endangered species. This is the new knowledge for DFW.

I would like to suggest to donors, international organizations, and NGOs continue the cooperation and solicits the support in order to follow up on the recommendations from the workshop.

Prior to closing, I express my acknowledgement of DANIDA of the Royal Government of Denmark that funds Cambodia Tree Seed Project and efforts of Mr. Jens Aare Olsen, CTA of Indochina Tree Seed Programme and DFW to organize such a workshop as well as thanks to participants from various Provinces taking their value time and effort to attend the event and share ideas and experiences to make the workshop successful.

Lastly, I wish your Excellency, ladies and gentlemen a safe return and am announcing the closing of the workshop. Thank you

## Annex 14. Abbreviations and Acronyms

AAP	Annual Activity Plan (= work plan)
ACIAR	Australian Centre for International Agricultural Research
ADB	Asian Development Bank
AIT	Asian Institute of Technology, Bangkok, Thailand
ASEAN	Region of Brunei, Indonesia, Malaysia, Philippines, Singapore, Thailand, Cambodia, Myanmar, Lao PDR and Vietnam
ATSC	Australian Tree Seed Centre of CSIRO Forestry and Forest Products
AusAID	Australian Agency for International Development
BL	Budget Line
CDC	Council for Development, Cambodia
CIC	Committee for Investment and Cooperation, Lao PDR
CIFOR	Centre for International Forestry Research, Bogor, Indonesia
CF	Community Forestry
CFSC	Central Forest Seed Company, Vietnam (earlier NFSC)
CSIRO	Commonwealth Scientific and Industrial Research Organization, Australia
CTSP	Cambodia Tree Seed Project of ITSP
CTA	Chief Technical Adviser
DAFO	District Agriculture and Forestry Office, Lao PDR
Danida	Danish International Development Assistance
DANCED	Danish Cooperation for Environment and Development
DFSC	Danida Forest Seed Centre, Humlebæk, Denmark
DFC	Danida Fellowship Centre, Copenhagen, Denmark
DFW	Department of Forestry and Wildlife of MAFF, Cambodia
DKK	Danish Kroner, currency unit, 1 USD = 8.25 DKK
DOF	Department of Forestry of MAF, Lao PDR
DOF	Department of Fisheries of MAFF, Cambodia
EU	European Union
EDRF	see EPSF
EPSF	(Danish) Environment Peace and Stability Fund of Denmark (= MIFRESA)
FAO	Food and Agriculture Organization of United Nations
FINNIDA	Finish Development Assistance
FORGENMAP	Forest Genetic Management Project of DANCED/EPSF in Thailand
FORB2	Monthly expenditure report to Danida
FRC	Forestry Research Centre of NAFRI (at Nam Souang), Lao PDR
FRI	Wildlife & Forest Research Institute of DFW, Cambodia
FRIM	Forestry Research Institute of Malaysia
FSIV	Forest Science Institute of Vietnam
GOL	Government of Lao People's Democratic Republic
GOV	Government of Socialist Republic of Vietnam
GRC	Gene Resource Conservation
GTZ	Gesellschaft für Technische Zusammenarbeit (German Technical Development Agency)
HCMC	Ho Chi Minh City (Saigon), Vietnam
HRD	Human Resource Development (including training)
ICRAF	International Centre for Research in Agro-Forestry
IFSP	Indonesia Forest Seed Project of Danida
IPGRI	International Plant genetic resources Research Institute, Italy
ISTA	International Seed Testing Association, Switzerland
ITSP	Indochina Tree Seed Programme (VTSP+LTSP+CTSP)
IUCN	The World Conservation Union
JICA	Japan International Cooperation Agency

KIP	Lao PDR currency unit, 1 USD = 8,100 KIP
LTSP	Lao Tree Seed Project
LFA	Logical Framework Approach
MARD	Ministry of Agriculture and Rural Development, Vietnam
MAF	Ministry of Agriculture and Forestry, Lao PDR
MAFF	Ministry of Agriculture, Forestry and Fisheries, Cambodia
MIFRESTA	New acronym for MIKA from spring 1999.
MIKA	Environment and Disaster Relief Fund, Denmark (EDRF)
MOU	Memorandum of Understanding / Country Agreement
MPI	Ministry of Planning and Investment, Vietnam
NAFRI	National Agriculture and Forestry Research Institute of MAF, Lao PDR
NC	Network Coordinator, Vietnam
NFAP	National Forestry Action Plan
NPM	National Project Manager
NSFRS	Nam Souang Forestry Research Station of FRC, Lao PDR
NSC	National Steering Committee
NTFP	Non-Timber Forest Products
PDR	People's Democratic Republic
PMU	Project Management Unit (NPM + TA)
PS	Permanent Secretary
QAP	Quarterly Activity Plan used by FRC, Lao PDR
RECOFT	Regional Community Forestry Training Centre, Bangkok, Thailand
RGC	Royal Government of Cambodia
RGD	Royal Government of Denmark
RIEL	Cambodian currency unit, 1 USD = 3,900
RDE	Royal Danish Embassy, Hanoi
RPMU	Regional Project Management Unit of ITSP (=3 PMUs, NC and CTA)
Sida	Swedish International Development Agency
SO	Seed Orchard
SS	Seed Source
TA	Technical Adviser
TFAP	Tropical Forestry Action Plan / Programme
TIP	Tree Improvement
TNA	Training Needs Assessment
TOR	Terms of Reference, a job description for Consultancies and missions
TOT	Training of Trainers
TSA	Support Office for Technical Issues in Danida, Copenhagen
TT	Telegraphic Transfer (of funds)
USD	United States Dollar (= 8.5 DKK)
UM	Ministry of Foreign Affairs, Denmark of which Danida is an integral part
VND	Vietnam Dong, 1 USD = 14,500 VND
VTSP	Vietnam Tree Seed Project of ITSP
WB	World Bank
WFP	World Food Programme of UN
WWF	Worldwide Fund For Nature

## **Annex 15 Experiences from Lao PDR**

### **Country Report Lao P.D.R. Summary of three priority tree species workshops.**

Paper presented at National Workshop on Priority Tree Species for Vietnam, Hanoi, 7 - 8 September 2000 by Technical Adviser, **Anders Jensen**, Danida

#### **Introduction:**

Three priority species workshops were conducted in late 1999 as part of a consultation procedure to lay out the most important and preferred tree species in seed supply. The planting target is in this year 20,000 ha and most of tree-planting and plantation establishment takes place in lowland areas along the Mekong River.

The aim was to identify and select tree species, which will benefit from an improved seed supply. This is the first step in developing a national seed supply strategy based on species-wise procurement strategies and thus integrating seed procurement, tree improvement, genetic conservation and marketing of tree seed.

#### **Objective:**

The answer is to determine those species that would have the highest impact and to make the best of limited financial, human, technical and infrastructure resources to improve the seed supply of desired and preferred species. Impact is the long-term and lasting result and relates to economic, environmental and other objectives. The term should be understood in a broader sense than planting objectives as it indicates societal and national values and wishes - and not only individual/personal ideas and answers.

With this in mind, the objective of the priority species exercise was to extend a helping hand to the Ministry of Agriculture and Forestry with the view to fine-tune its planting programme.

More specifically, the objectives were:

- To provide the Lao Tree Seed Centre with a tentative list of priority species for follow-up in respect to seed procurement, tree improvement, conservation and marketing,
- To direct district and provincial forest authorities in their efforts towards improving the seed supply,
- To guide research and development activities on tree species.

At a practical level, a priority species list will ease the identification and selection of additional seed sources of new and may be lesser known species, which will contribute to overcoming the present shortage of seed of indigenous species. It will also be valuable in ensuring sufficient diversity in present and future planting programmes.

#### **Results:**

Naturally, the choice of species reflects the present situation regarding the major use of trees in a market economy, namely production of timber. Much emphasis was given to



timber species in long rotation as small or large plantations and to a high value product, which is less susceptible to market, fluctuations, refer table 1 below for details.

Very interesting is the high emphasis placed on native species that are local alternatives to fast-growing exotic, e.g. *Alstonia scholaris*, *Wrightia tomentosa* and *Anthocephalus chinensis*. The follow-up on this, however, requires a lot of work and investment in methods and approaches for domestication of lesser-known native species. There is presently no clear idea or concept on how these species will yield products and services, and what really can be expected using species normally found in closed forests or on forest fringes but now domesticated under different conditions, for example in community wood lots or on farm-land.

Furthermore, the consultation procedure allowed the identification of groups of species where seed users can be reached directly through improved seed supply by a seed center (in terms of quantity and quality). This is mainly the case for timber and non-timber species and species for rehabilitation of degraded sites. Other groups of species will not be part of an organized seed supply and here improvements in quality and quantity of seed more efficiently and effectively can be achieved through extension: agro-forestry and firewood species as well as ornamental species.

Species suitable for watershed management were not identified due to the general feeling that the objectives of watershed management can be reached with planting in general and that forest cover itself will have a positive impact on water retention and water balance. Trees are very rarely planted solely for the objective of watershed protection and it is not possible to identify species, which only serves this purpose.

The general criteria applied when limiting the number of species within each group were:

- Multipurpose species rather than single-purpose species;
- Species applicable to ecological conditions on planting sites in lowland areas - mainly on adverse sites, i.e. degraded soils and/or grass infested on abandoned agricultural areas, frequently burned areas due to shifting cultivation, shrub land, bamboo and degraded secondary forest with variable and often harsh conditions without a feasible option of weeding, fertilizing, etc.
- Important species that presently are difficult to procure (“bottleneck-species”) due to lack of knowledge and experience in seed collection, handling and processing – especially recalcitrant species and/or lesser-known species with high potential in domestication;
- Species for which immediate seed procurement is possible and feasible from sources in plantations and/or in natural forests;
- Species where the end product and/or end-use are in high demand or expected to be in high demand in the future.

Table 1: Priority Tree Species in Lao P.D.R. (preliminary findings)

<b>GROUP</b>	<b>MAIN PURPOSE OF PLANTINGS</b>	<b>TYPE OF PLANTINGS</b>	<b>ROTATION PERIOD</b>
<b>1. Slow growing timber species</b> <i>Dalbergia cochinchensis</i> <i>Dalbergia cultrata</i> <i>Sindora cochinchensis</i> <i>Tectona grandis</i> <i>Azadirachta indica</i> <i>Pterocarpus macrocarpus</i> <i>Swietenia mahogany</i> <i>Hopea odorata</i> <i>Dipterocarpus alatus</i> <i>Anisoptera cochinchensis</i> <i>Toona ciliata</i> <i>Chukrasia tabularis</i> <i>Xylia kerrii</i> <i>Vatica cinerea</i>	High value timber	Small and large plantations	Long Very long
<b>2. Fast growing timber species</b> <i>Acacia mangium</i> <i>Acacia crassicarpa</i> <i>Acacia auriculiformis</i> <i>Eucalyptus camaldulensis</i> <i>Wrightia tomentosa</i> <i>Alstonia scholaris</i> <i>Anthocephalus chinensis</i> <i>Pelthophorun dasyrachis</i> <i>Ailanthus malabarica</i> <i>Gmelina arborea</i>	Middle and low value timber	Spot-plantings Wood-lots Small and large plantations	Short Intermediate
<b>3. Non timber species</b> <i>Aquilaria crassna</i>	Non-timber forest products with high unit market value	Single-tree Wood-lots Small plantations	Very short Short Intermediate Long Very long
<b>4. Agro-forestry species</b> <i>Azadirachta indica</i>	Support to agricultural production systems (food, fodder, fencing)	Single-tree Spot-plantings Wood-lots	Long Very long
<b>5. Species suitable for rehabilitation of degraded sites</b> <i>Albizia lebbek</i> <i>Albizia procera</i> <i>Gliricidia sepium</i> <i>Leucaena leucocephala</i>	Soil fertility & improvement Land reclamation	Small and large plantations	Intermediate Long Very long
<b>6. Species suitable in watershed management</b> <i>(No particular species)</i>	Water balance & retention Erosion protection & stabilization	Spot-plantings Wood-lots Small and large plantations	Medium Long Very long
<b>7. Firewood species</b> <i>(No particular species)</i>	Firewood	Spot-plantings Wood-lots Small plantations	Intermediate Long
<b>8. Ornamental tree species</b> <i>(No particular species)</i>	Amenity, shade, etc.	Single-tree	Long Very long

## Annex 16 Tree Species Priority Workshops and seminars in Vietnam

By *Ngyuen X. Lieu*, National Network Coordinator and *Lars Schmidt*, Technical Adviser, Vietnam Tree Seed Project

The major activity on forest tree planting in Vietnam is the governmental programme 661 in which 5 million hectares of forests are planned to be established between 1998 and 2010. In process of the project's operation, the provincial authorities are concerned with identification of types and structures of species.

Forestry Development Department (FDD) together with Central Forest Seed Company and Vietnam Tree Seed Project (VTSP) organized 6 regional workshops and a national seminar on priority tree species in Vietnam during the second half of year 2000. Invited guests were primarily provincial forestry departments and forestry institutions. The main objective of the workshop was:

1. Determine criteria for selection of species used in plantation and their priorities in eco-regions.
2. Identify list of trees for plantation and their priorities use for re / afforestation programmes in the regions.
3. Serve as guidelines for development of seed sector in such activities as seed source establishment, seed procurement, tree improvement, and seed supply network, market development for tree seeds.
4. Serve as basis for activities in studies of species, establishment of conservation stands of endangered precious species.

The structure of the workshops was inspired by the experience from Lao Tree Seed Project (LTSP), and the Technical Adviser from LTSP facilitated the first two of the workshops. Forest plantations were categorized into 5 classes.

- 1: Industrial plantation
- 2: Plantation for local uses
- 3: Plantation of non- timber forest trees
- 4: Protective plantation
- 5: Plantation for bio-diversity conservation.

No	Region <sup>1</sup>	Total of Species	Number of species according to planting purpose				
			<i>Industry</i>	<i>Local Use</i>	<i>Non-Wood</i>	<i>Protection</i>	<i>Conservation</i>
1.	NW	64	21	7	20	31	20
2.	CN	65	26	8	19	32	20
3.	NE	48	10	12	12	23	16
4.	NC	61	13	18	15	28	22
5.	SC	48	13	18	14	27	15
6.	CH	84	17	17	27	16	36
7.	SE	55	11	9	33	8	14
8.	SW	57	04	15	32	10	18
	<b>Country</b>	<b>192</b>					

<sup>1</sup> Region corresponds to 8 of the 9 ecological regions of Vietnam; the 9th Red River Delta (RR) is not represented as there is very little planting in that region

Based on the results a total list of species and regions were established (Table 1); an extract from the table in which plantation species and species for gene conservation was separated appears in Table 2 and 3. It should be noted that the list in Table 2 contains all species of planting categories 1-4 above.

The lists are still somehow inconvenient and need further elaboration. During the national seminar it was agreed to establish a small core-working group to work out proposals for national and regional priority species. A likely result of this work, as suggested by participants of the seminar, may be regional and national priority lists with following categories for follow up actions based on four classes.

1. **Leading species.** On national level about 10. These species, which are all widely planted in the country, will be subject to intensive seed research and advanced tree breeding and propagation
2. **High priority species.** On national level about 20-25. These species which are planted on a lower scale than '1' and only in some regions, should be subject to low intensity tree improvement (establishment of Breeding Seed Orchards and Seed Production Areas), basic phenology and seed research, e.g. desiccation and storage trials. Seed production and handling guidelines as well as nursery and silvicultural guidelines should be elaborated.
3. **Common and promising species** with presently only local or limited planting area but which may have potential for more intensified use. The main activity for these species is to identify suitable seed sources in natural forests or plantations, which match potential or actual planting sites. Basic seed and propagation guidelines should be elaborated as well as silvicultural practices. Where the species have local high priority, more intensified activities may be needed on local level.
4. **Threatened or endangered species** with currently little or no planting program. The main activity for this group should be conservation, either in situ or ex situ to assure protection and maintenance of important genetic resources. Where ex situ stands are established it may be combined with low intensity tree breeding such as breeding seedling seed orchards. Most endangered species have difficult propagation and a natural and necessary activity would thus be development (but in the present phase not extension) of appropriate propagation techniques.

Based on the overall discussions it was suggested to initiate following actions:

1. Carry out surveys and research on biological characteristics of priority species.
2. Survey and make seed technical standards (phenology, collection technique, processing, storage, seed testing, pre-treatment) for selected indigenous trees species.
3. Invest in establishment of seed sources in order to be prepared to produce sufficient amount of high genetic quality seeds for priority species in each regions.
4. Study and apply vegetative propagation technology for suitable tree species.
5. Build up technical procedures or technical guidelines for seed sowing, planting, management and forest enrichment planting for priority species for which there is no documented technical procedures.
6. Establish demonstration plots for typical indigenous species in each region, to serve as basis for introduction, research, learning and sharing experiences between regions all over the country.
7. Strengthen protection in designated special-use forests, while establishing in-situ and ex-situ conservation areas for most important species.

8. Promote research on species, provenance trials and introduction of high productivity and high quality species and clones, meeting the demand of users and suitable for local technology.
9. Exchange information and planting materials with neighbour countries with similar ecological conditions and the same species in order to enrich genetic resources for species with wide distributions.
10. Of the total 1,000 endemic species, which are, distributed in different ecosystems in the country, at present only a small number of them are used for plantation and exploitation. Therefore, in the coming period it is necessary to carry on general research (biological characteristics, ecological characteristics, regeneration, seed technique, silvicultural methods, seed sowing, planting technique, management, exploitation, processing and use of products) in order to find out valuable species, adding to assortment of planting trees and making forests more diverse and with higher economic values.

A widely discussed topic at the workshop and seminar was the current limited use of local species in the planting programs. Vietnam seems in this regard to have come into the self accelerating process where local species are little planted because of problems in 1) obtaining, 2) too high price and 3) poor quality of seed. Since the demand is small it is difficult for the supplier to supply good quality seed at a reasonable price when needed.

**Table 1. List of tree species use for re/afforestation programmes in Vietnam (compilation from workshops)**

No.	Name of species	Region							
	Botanical name	Nw	cn	ne	nc	sc	ch	se	sw
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Acacia auriculiformis	x	x	x	x	x	x	x	x
2	Acacia mangium		x	x	x	x	x	x	
3	Acacia auriculiformis x A. mangium		x	x			x	x	x
4	Aegiceras corniculatum				x	x			x
5	Afzelia bijuga								x
6	Afzelia xylocarpa					x	x	x	
7	Ailanthus malabarica					x			
8	Aleurites montana	x	x	x	x				
9	Alnus nepalensis	x	x						
10	Alstonia scholaris	x				x		x	x
11	Altingia takhtadjianii	x	x						
12	Anacardium occidentale					x	x	x	x
13	Anisoptera cochinchinensis							x	
14	Annona reticulata								x
15	Anthocephalus indicus								x
16	Aquilaria crassna	x	x	x	x	x	x	x	x
17	Araucaria excelsa						x		
18	Artocarpus interprifelium						x	x	x
19	Avicennia sp.					x			x
20	Bambusa spp.	x	x	x	x	x	x	x	x
21	Bauhinia sp.							x	x
22	Betula alnoides	x	x	x					
23	Bombax ceiba		x						
24	Bouea macrocarpa							x	x
25	Bruguiera gimnorhiza								x
26	Bruguiera sp								x
27	Burretiodendron hsienmu	x	x	x					
28	Caesalpinia sappan			x					
29	Caesalpinia sp.							x	x
30	Calamus rudentum	x	x		x	x	x		
31	Calamus tenuis	x	x		x		x		
32	Calocedrus macrolepis					x	x		
33	Calophyllum sp.					x		x	x
34	Canarium subulatum							x	x

35	Canarium spp.	x	x	x	x		x		
36	Careya sphaerica							x	
37	Choerespondias axillaris			x					
38	Chrysophyllum calnito							x	x
39	Endospermum chinensis	x	x	x	x	x	x		
40	Cassia floribunda							x	x
41	Cassia glauca	x	x	x					
42	Cassia siamea	x	x	x	x	x	x		
43	Castanopsis spp./Quercus spp.			x	x		x		
44	Castanopsis fissa				x				
45	Casuarina equisetifolia				x	x		x	
46	Ceiba pentandra						x		
47	Cephalotaxus hainanensis						x		
48	Chukrasia tabularis	x	x	x	x		x		
49	Cinnamomum balansae	x	x	x	x		x	x	
50	Cinnamomum camphora	x	x		x	x			
51	Cinnamomum cassia	x	x	x	x	x	x	x	x
52	Cinnamomum partheroxylon	x	x		x	x		x	x
53	Cinnamomum polyadelphum								x
54	Cocos nucifera				x	x		x	x
55	Combretum quadrangulare								x
56	Cryptocarya sp.						x	x	
57	Cunninghamia lanceolata	x	x	x			x		
58	Cupressus funebris	x	x						
59	Cupressus torulosa			x		x			x
60	Dacrydium pierri						x		
61	Dalbergia annamensis					x	x		
62	Dalbergia bariensis						x	x	
63	Dalbergia cochinchinensis				x		x		
64	Dalbergia hupeana	x							
65	Dalbergia mammosa						x	x	
66	Dalbergia sp.				x				
67	Dalbergia sp.					x			
68	Delavaya yunnanensis	x	x						
69	Denolix regia	x	x						x
70	Dendrocalamus flagellifer	x	x						
71	Dendrocalanus membranaceus	x	x		x				
72	Dendrocalamus sp.				x				
73	Dimocarpus longan	x	x	x	x	x		x	x
74	Diospyros kaki						x		
75	Diospyros mollis							x	x
76	Diospyros mun	x	x						
77	Diospyros siamensis							x	x
78	Diospyros sp.				x	x			
79	Diospyros sp.				x				
80	Dipterocarpus alatus					x	x	x	x
81	Dipterocarpus grandiflorus						x		
82	Dipterocarpus dyeri							x	
83	Dipterocarpus obtusifolius						x		
83	Dracontomelon mangiferum	x	x	x	x				
85	Ducampopinus krempfii					x	x		
86	Durio zibethinus						x	x	x
87	Dysoxylum cauliflorum	x	x		x				
88	Engelhardtia chrysolepis			x					
89	Erythrophloeum fordii	x	x	x	x				
90	Eucalyptus spp.		x	x	x	x	x	x	x
91	Fokienia hodginsii	x	x	x	x	x	x		
92	Garcinia fagraeoides			x	x				x
93	Gigantochloa sp.						x		
94	Gliditsia fera					x			
95	Glyptostrobus pensilis						x		
96	Gmelina arborea					x		x	
97	Heritiera litoralis								x
98	Hevea brasiliensis				x	x	x	x	
99	Hexaneuro brillettiicarpon	x	x						
100	Hopea sp dealbata						x		
101	Hopea odorata					x	x	x	

102	<i>Hopea pierrei</i>						X		X
103	<i>Hopea</i> sp.						X		
104	<i>Illicium verum</i>		X	X					
105	<i>Ilex trifolia</i>			X					
106	<i>Keteleeria davidiana</i>	X	X				X		
107	<i>Khaya senegalensis</i>	X	X		X		X	X	
108	<i>Lagerstroemia angustifolia</i>								X
109	<i>Lagerstroemia calyculata</i>	X				X			
110	<i>Lagerstroemia flosreginae</i>							X	X
111	<i>Litchi sinensis</i>	X	X		X				
112	<i>Linociera ramiflora</i>			X					
113	<i>Liquidambar formosana</i>			X					
114	<i>Litsea sebifera</i>				X	X	X		
115	<i>Lumnitzera coccinea</i>							X	X
116	<i>Madhuca pasquieria</i>	X	X	X	X				
117	<i>Magnolia dandyi</i>	X	X	X	X				
118	<i>Mangifera minor</i>	X	X		X	X		X	X
119	<i>Manglifer foetida</i>	X	X						
120	<i>Manglietia glauca</i>	X	X	X	X				
121	<i>Markhamia stipulata</i>			X	X				
122	<i>Melia azedarach</i>				X			X	X
123	<i>Meulaleuca leucadendra</i>								X
124	<i>Michelia champaca</i>	X	X						
125	<i>Michelia medioclic</i>				X		X		
126	<i>Nephelium bacsasense</i>					X	X	X	X
127	<i>Nipa frutescens</i>					X			X
128	<i>Ormosia tonkinensis</i>			X	X				
129	<i>Parashorea chinensis</i>	X	X		X				
130	<i>Paullownia portunei</i>		X	X		X			
131	<i>Payena floribunda</i>					X		X	X
132	<i>Pelthophorum tonkinensis</i>	X	X	X	X				
133	<i>Phoebe cuneate</i>	X	X	X					
134	<i>Phyllostachys</i> spp.	X	X	X					
135	<i>Pinus caribaea</i>		X		X	X	X		
136	<i>Pinus excelsa</i> ( <i>Pinus dalatensis</i> )						X		
137	<i>Pinus kesiya</i>						X		
138	<i>Pinus kwangtungensis</i>						X		
139	<i>Pinus massoniana</i>	X	X	X					
140	<i>Pinus merkusii</i>	X	X	X	X	X	X		
141	<i>Podocarpus neriifolius</i>	X	X	X			X		
142	<i>Podocarpus fleuryi</i>	X	X		X		X		X
143	<i>Podocarpus imbricatus</i>						X		
144	<i>Podocarpus imbricatus</i>								X
145	<i>Podocarpus</i> sp.			X					
146	<i>Protium serratum</i>	X							
147	<i>Prunus persica</i>	X	X				X		
148	<i>Prunus salicina</i>	X	X				X		
149	<i>Pterocarpus macrocarpus</i>					X	X	X	
150	<i>Pterocarpus pedatus</i>					X	X	X	
151	<i>Pygeum arboreum</i>						X		
152	<i>Renanthera</i> sp.						X		
153	<i>Rhizophora conjugata</i>				X				X
154	<i>Rhizophora</i> sp.					X		X	X
155	<i>Salix babylonica</i>						X		
156	<i>Schefflera octophylla</i>				X				
157	<i>Schima wallichii</i>	X	X	X					
158	<i>Shorea cochinchinensis</i>							X	
159	<i>Shorea falcata</i>					X			
160	<i>Shorea hypeochra</i>								X
161	<i>Shorea roxburghii</i>							X	
162	<i>Sindora siamensis</i>				X		X	X	
163	<i>Sindora tonkinensis</i>				X				
164	<i>Sonneratia</i> sp.					X			X
165	<i>Sophora</i> sp.				X				
166	<i>Soscinium fenestratum</i>						X		
167	<i>Sterculia lychnophora</i>					X	X	X	X
168	<i>Styrax tonkinensis</i>	X	X	X	X				

169	Swietenia macrophylla	x	x						
170	Syzygium chunianum				x				
171	Talauma gioi	x	x	x	x				
172	Tamarindus indica					x			
173	Tarrietia javanica				x	x			
174	Taxus chinensis	x	x				x		
175	Tectona grandis	x	x			x	x	x	
176	Termilamia catappa	x							
177	Terminalia chebula						x		
178	Thea sasanqua	x	x	x	x				
179	Thea sinensis		x						
180	Toona febrifuga						x		
181	Toona sinensis	x	x	x					
182	Vatica odorata	x	x	x	x				
183	Xylia dolabriformis						x	x	
184	Xylocarpus granatum								x
185	Xylocarpus sp								x
186	Ziziphus sp.		x	x					
187	{Scientific name not identified}						x		
188	{Scientific name not identified}						x		
189	{Scientific name not identified}						x		
190	{Scientific name not identified}						x		
191	{Scientific name not identified}						x		
192	{Scientific name not identified}							x	x

NB: Please note that the species names were reported in Vietnamese and some in local dialects and some names (no. 187-192) has not yet been specified to scientific names.

**Table 2. List of priority tree species use for re/afforestation programmes in Vietnam (extract from total list)**

No	Name of species	Region							
		Nw	cn	ne	nc	sc	ch	se	sw
1	Acacia auriculiformis	x	x	x	x	x	x	x	x
2	Acacia mangium		x	x	x	x	x	x	
3	A. auriculiformis X A. Mangium		x	x			x	x	x
4	Azelia xylocarpa					x	x	x	
5	Aleurites montana	x	x	x	x				
6	Anacardium occidentale					x	x	x	x
7	Aquilaria crassna	x	x	x	x	x	x	x	x
8	Bambusa sp.	x	x	x	x	x	x	x	x
9	Calamus rudentum	x	x		x	x	x		
10	Calamus tenuis	x	x		x		x		
11	Canarium spp.	x	x	x	x		x		
12	Cassia glauca	x	x	x					
13	Cassia siamea	x	x	x	x	x	x		
14	Castanopsis spp./Quercus spp.			x	x		x		
15	Casuarina equisetifolia				x	x		x	
16	Chukrasia tabularis	x	x	x	x		x		
17	Cinnamomum balansae	x	x	x	x		x	x	
18	Cinnamomum camphora	x	x		x	x			
19	Cinnamomum cassia	x	x	x	x	x	x	x	x
20	Cinnamomum partheroxylon	x	x		x	x		x	x
21	Cocos nucifera				x	x		x	x
22	Cunnunghamia lanceolata	x	x	x			x		
23	Dendrocalanus membranaceus	x	x		x				
24	Dimocarpus longan	x	x	x	x	x		x	x
25	Dipterocarpus alatus					x	x	x	x
26	Dracontomelon mangierum	x	x	x	x				
27	Endospermum chinensis	x	x	x	x	x	x		
28	Erythrophloeum fordii	x	x	x	x				
29	Eucalyptus spp.		x	x	x	x	x	x	x
30	Hevea brasiliensis				x	x	x	x	
31	Hopea odorata					x	x	x	



32	<i>Illicium verum</i>		x	x					
33	<i>Khaya senegalensis</i>	x	x		x		x	x	
34	<i>Litchi sinensis</i>	x	x		x				
35	<i>Litsea sebifera</i>				x	x	x		
36	<i>Madhuca pasquieria</i>	x	x	x	x				
37	<i>Mangifera minor</i>	x	x		x	x		x	x
38	<i>Manglietia glauca</i>	x	x	x	x				
39	<i>Parashorea chinensis</i>	x	x		x				
40	<i>Paulownia portunei</i>		x	x		x			
41	<i>Peltophorum ferrugineum</i>	x	x	x	x				
42	<i>Phoebe cuneate</i>	x	x	x					
43	<i>Pinus caribaea</i>		x		x	x	x		
44	<i>Pinus kesiya</i>	x	x				x		
45	<i>Pinus massoniana</i>	x	x	x					
46	<i>Pinus merkusii</i>	x		x	x	x	x		
47	<i>Pterocarpus spp.</i>					x	x	x	
48	<i>Rhizophora spp.</i>					x		x	x
48	<i>Sindora siamensis</i>				x		x	x	
50	<i>Schima wallichii</i>	x	x	x					
51	<i>Styrax tonkinensis</i>	x	x	x	x				
52	<i>Sterculia lychnophora</i>					x	x	x	x
53	<i>Talauma gioi</i>	x	x	x	x				
54	<i>Tarrietia javanica</i>				x	x			
55	<i>Thea sasanqua</i>	x	x	x	x				
56	<i>Tectona grandis</i>	x	x			x	x	x	
57	<i>Toona sinensis</i>	x	x	x					

**Table 3. List of priority tree species for gene conservation (Extract from total list)**

No.	Name of species Botanical Name	Region							
		Nw	cn	ne	nc	sc	ch	se	sw
1	<i>Azelia xylocarpa</i>					x	x	x	
2	<i>Altingia takhtadjanii</i>	x	x						
3	<i>Anisoptera cochinchinensis</i>							x	
4	<i>Aquilaria crassna</i> Pierre.	x	x	x	x	x		x	x
5	<i>Bruguiera gimnorhiza</i>								x
6	<i>Burretiodendron hsienmu</i>	x	x	x					
7	<i>Calocedrus macrolepis</i>					x	x		
8	<i>Cephalotaxus hainanensis</i>								
9	<i>Cestrum nocturnum</i>				x				
10	<i>Chukrasia tabularis</i>	x	x	x	x		x		
11	<i>Cinnamomum balansae</i>	x	x	x	x		x		
12	<i>Cinnamomum polyadenophum</i>								x
13	<i>Cupressus funebris</i>	x	x						
14	<i>Cupressus torulosa</i>			x		x			x
15	<i>Dacrydium pierrei</i>						x		
16	<i>Dalbergia annamensis</i>				x	x	x		
17	<i>Dalbergia bariensis</i>						x	x	
18	<i>Dalbergia mammosa</i>						x	x	
19	<i>Dalbergia</i> sp. (scient. name n. ident.)				x				
20	<i>Dalbergia</i> sp. (scient. name not identif.)				x	x	x		
21	<i>Diospyros mun</i>	x	x		x	x			
22	<i>Diospyros siamensis</i>							x	x
23	<i>Dipterocarpus alatus</i>							x	
24	<i>Dipterocarpus grandiflorus</i>						x		
25	<i>Dipterocarpus dyeri</i>							x	
26	<i>Dysoxylum cauliflorum</i>	x	x		x				
27	<i>Ducampopinus krempfii</i>					x	x		
28	<i>Erythrophloeum fordii</i>	x	x	x	x				
29	<i>Fokienia hodginsii</i>	x	x	x	x	x	x		
30	<i>Fagraea fragans</i>							x	x
31	<i>Garcinia fragraeoides</i>			x	x				
32	<i>Glyptostrobus pensilis</i>						x		
33	<i>Hexaneuro brilletti</i> carpon	x	x						

34	<i>Hopea odorata</i>							x	
35	<i>Hopea pierrei</i>						x		x
36	<i>Lagerstroemia angustifolia</i>					x			x
37	<i>Keteleeria davidiana</i>	x	x				x		
38	<i>Madhuca pasquieri</i>	x	x		x				
39	<i>Magnolia dandyi</i>	x	x	x	x				
40	<i>Markhamia stipulata</i>			x	x		x		
41	<i>Michelia</i> spp.								
42	<i>Parashorea chinensis</i>	x	x						
43	<i>Pinus excelsa</i> ( <i>Pinus dalatensis</i> )						x		
44	<i>Pinus kwangtungensis</i>						x		
45	<i>Podocarpus fleuryi</i>	x	x		x		x		x
46	<i>Podocarpus imbricatus</i>			x			x		x
47	<i>Podocarpus neriifolius</i>	x	x	x			x		
48	<i>Pterocarpus pedatus</i>					x	x	x	
49	<i>Pterocarpus macrocarpus</i>					x	x	x	
50	<i>Renanthera</i> sp.						x		
51	<i>Shorea cochinchinensis</i>			x				x	
52	<i>Shorea falcata</i>					x			
53	<i>Sindora siamensis</i>				x		x	x	
54	<i>Sindora tonkinensis</i>				x				
55	<i>Sterculia lychonoflora</i>					x	x	x	
56	<i>Talauma gioi</i>	x	x	x	x				
57	<i>Tarrietia javanica</i>				x				
58	<i>Taxus chinensis</i>	x	x				x		
59	<i>Utricularia</i> sp.						x		
60	<i>Vatica odorata</i>	x	x	x	x				
61	<i>Xylia dolabriformis</i>						x	x	
62	<i>Xylocarpus granatum</i>								x

## Annex 17 Questionnaires on Tree Seed Demand mailed to Workshop Participants

Cambodia Tree Seed Project

Priority Tree Species Workshop, August 15 - 16, 2000

### Questionnaire – seed demand

Please fill in the questionnaire if you are engaged in any tree-planting activity in the year 2000. Your answer will provide an idea of the actual demand for seed and the project will revert to you if you are interested in buying tree seed in the future.

---

Name:

Organization:

Address:

1. Type of tree-planting activity and area - indicate how many hectares in each group:

- On-farm planting (< 0.5 ha):
- Small plantation establishment (0.5 – 5.0 ha):
- Large plantation establishment (> 5.0 ha):

2. Purpose of tree-planting – please tick off:

- Watershed protection
- Fuel wood
- Agro forestry systems
- Timber products
- Non-timber products
- Multipurpose planting – specify:
- Other purposes:

3. Location of tree planting (province and district):

4. Choice of species and quantity:

Preferred species & provenances:	Quantity required (either kg of seed or number of seedlings):
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

5. Seedling delivery: do you buy seedlings or do you produce your own seedlings?

6. If own seedling production – at what price do you want to buy seeds (USD/kg pr. specie):

7. If own seedling production – where do you presently get your seeds from and at what price?

8. How much do you value the quality of seed?

Genetic quality

Physiological quality

9. Are you interested in buying seeds from DFW / CTSP?

10. Please comment on your past experience on seed supply.

Thank you!

## CAMBODIA TREE SEED PROJECT

### Expressed seed demand by request to Department of Forestry and Wildlife

Please return to Cambodia Tree Seed Project at DFW, 40 Preah Norodom Blvd. Phnom Penh. Fax: 23 213612, Tel: 23 215034, Email: [ctsp@bigpond.com.kh](mailto:ctsp@bigpond.com.kh)

Name:	Date:	No.:
Organization/project/company/government agency:	Address:	
Tel./fax:	E-mail:	
Species & provenance: (Scientific and vernacular name)	Quantity (either kg of seed or number of seedlings):	
1.		
2.		
3.		
4.		
5.		
Purpose:	Location (province, district, village):	
Delivery time (month & year):	Delivery place:	
Mode of delivery (e.g. packing):	Price (willingness to pay – USD/kg):	
Remarks:		