Thoughts towards the end of Cambodia Tree Seed Project

by
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As the Cambodia Tree Seed Project (CTSP) draws to a close by the end of June, it is an opportune time to look back over the activities undertaken and to assess the achievements gained during its lifetime, as well as their implications for future forest management.

The regional programme document was basically agreed between Cambodia and Denmark in 1997 for Vietnam, Lao and Cambodia. However for various political reasons the project did not start in Cambodia before several years later and outputs began to materialise in late 2001. It was stressed in the agreement that conservation, livelihood improvements, farmer orientation and poverty reduction needed more into focus, thus reflecting the overall national development objectives of Cambodia. This approach has enabled the project to engage in broader forest sector development and also the way that things were interpreted ensured that the project receive a 1 ½ year extension.

Sustainable forest management and poverty alleviation are central forestry sector development objectives. Only by having this concept very clear in mind there will be a role to play for natural forest in many developing countries.

General Project Achievements

Achievements in relation to the Project Document objectives are listed in Table 1, with individual highlight further detailed below.

Table 1 – Project Results in Accordance with Pre-Defined Outputs

Output No	Output	Result
I.A.1	Proposals for appropriate policies and legal framework for the tree seed sector	Draft sub-decree for seed import, export and transportation 35 seed stands and several ministerial declarations Forest gene conservation strategy adopted Guideline on site selection and tree planting Eco-zoning map and species-site matching model introduced to decentralised forestry planning levels Several concept papers focusing on potential forestry sector contributions to poverty reduction Conservation of valuable indigenous trees – a case study highlighting the Cambodia example on the international scene.
I.A.2	Proposals for marketing	Considered premature within Cambodia context by review mission due to lack of ability and will to pay for seed
I.A.3	Proposals for organisation of the tree seed sector	Community based seed procurement successfully piloted Detailed analysis of costs and benefits of decentralised seed supply Database of seed sources, seed collection and distribution
I.A.4	Proposals for regional collaboration	Collaborative relationships formed with APFORGEN. Partnership Agreement with Forest and Landscape Denmark.
II.A	Relevant knowledge and capabilities of selected staff at relevant national institutions upgraded	See Table 2 (Capacity Development
II.B	Relevant methods and technologies imparted to seed owners and users	Annex 1 (Extension materials)
III	Methods, documentation and technologies for collection,	Guidelines for collection, testing, pre-treatment, storage and sowing of seed for priority species

	handling and storage of forest seed improved	Ongoing collaboration with universities, nurseries and NGOs Screening of 21 species Provenance trials and seed production areas Project office and seed laboratory equipped and functional Communications network, internet and shared files facility installed. Library established and operational.
IV	National strategies for conservation and use of genetic resources of indigenous priority species in place	Seed source registers Eco-zoning map Forest gene conservation strategy GIS based species-site matching model 35 *in-situ* conservation stands established and managed 9 *ex-situ* conservation stands established and managed Agreement with FLD for institutionalisation of forest gene conservation Project documents prepared and submitted to donors to implement the forest gene conservation strategy

Capacity Building

Capacity building has been a central element of the project in aiming towards its immediate objective of *development of the tree seed sectors in Cambodia with special emphasis on indigenous species*. A range of learning approaches have been adopted (classroom, learning by doing, study tours/field visits, workshops, seminars on-the-job-training etc), within various settings (national, regional, international) and therefore, using a mix of languages (Khmer, English). It has enabled a large number of forestry and related staff to progress within respective fields more openly and confidently, and has achieved:

a far reach, to all levels of the Forestry Administration, community members, NGOs, the armed forces and the private sector

upgraded teaching knowledge at RUA and PLNSA

a broad range of extension materials appropriate for diverse target groups (listed in Annex 1)

Table 2 indicate the number of participants, officer on different types of training. In addition comes villagers and others.

Table 2 –Capacity Development organised by project

Type	No of participants			
	Training course	Seminar Conference	Study tour	Field training
International/Regional	60	13	23	
National	1262	326	137	291

Forest Gene Conservation Strategy – Gene-Ecological Zonation

The strategy was developed by a multi-disciplinary expert group, as a guide to forest gene conservation activities. It adopts the principle of conservation through promoting the use quality planting materials of 'priority' species in tree planting programmes.

The Gene-Ecological Zonation Model provides a tool for assessing species against site conditions, in order to better plan forest gene conservation and tree planting. Within Cambodia, 7 distinct ecological zones have been identified, where a gene-ecological zone is an area with sufficiently uniform ecological conditions to assume similar genetic characteristics within a species.

Seed quality – a must for planting

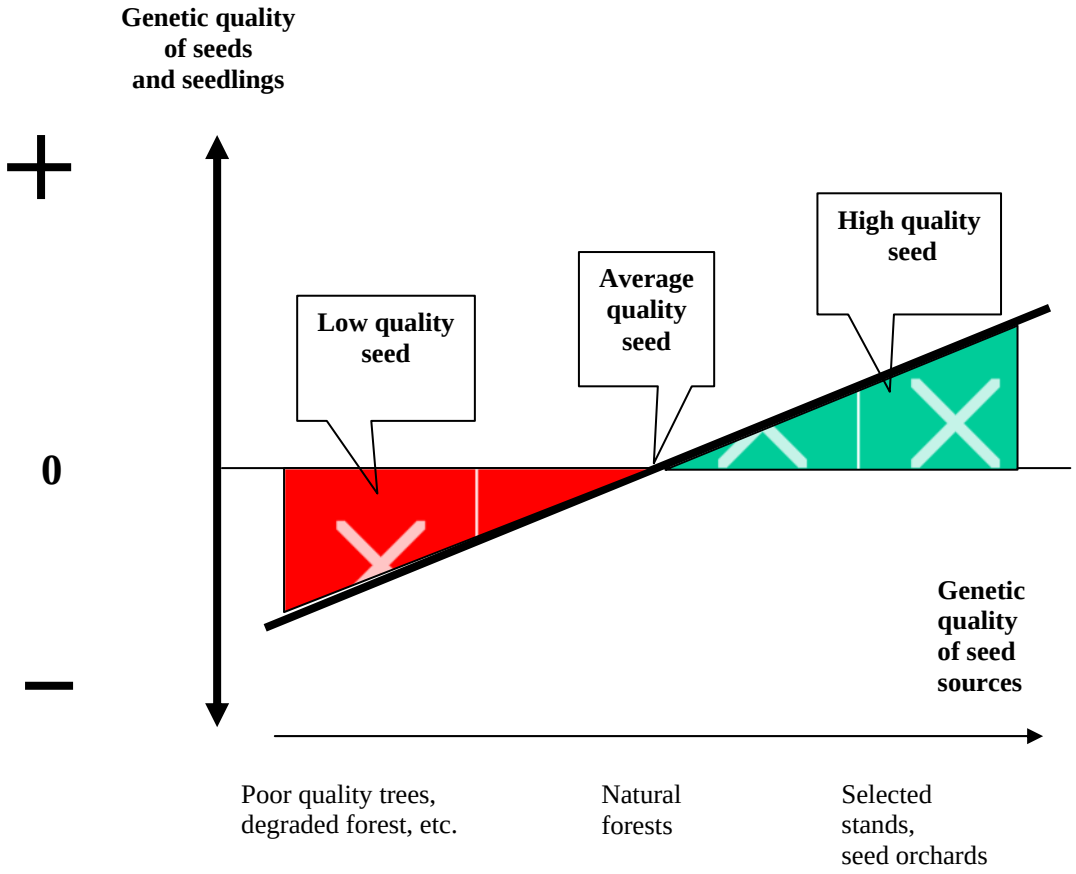
Several forest gene conservation stands/seed sources have been established throughout the country, and trials being conducted using indigenous species. The principle of the impact of using seed from these sources in tree planting programmes can be seen in the general graph below. It illustrates that seed quality increases following tree improvement, which may require high inputs in terms of financial and human resources. The lower end of the graph, however, indicates huge potential for improvement.

Raising seed quality through the reduction of the poor quality fraction has been the approach taken by CTSP instead of "high-flying" dreams of jumping directly into highly breed or laboratory produced planting material.

As high quality seed results from tree improvement programmes, it can be expected that in the future, commercial species, with a recognised high value are more likely to be attractive to the private sector. The remainder may be those species of long-term benefit (slow rotation) that are necessary for conservation and environmental protection, objectives to which the Royal Government of Cambodia has an obligation to support in meeting its development objectives, best met through a decentralised approach adopting low cost solutions.

Seed is a product that is non-transparent at the time of purchase, which increases the level of responsibility on the government to ensure that good seed is traded. Continued use of poor quality seed will continue to result in poor quality trees, a national disaster in terms of foregone income potential, and negligence towards poverty reduction in rural communities.

Graph 1 – Relationships between the genetic quality of seed sources and seed/lings



Community Based Seed Source Management

Whilst most of the seed sources/gene conservation stands are managed by local levels of the Forestry Administration, participatory approaches have been piloted with promising results. This approach indicates that the optimal management system for seed sources will draw on the strengths of a number of stakeholders, including the Forestry Administration, civil society, supporting NGOs and the private sector. It illustrates local people to be well placed, and interested to manage seed sources, with potential benefits of security of access to resources, additional income and market access, and enhanced capacity. Meanwhile, the Forestry Administration is expected to experience a significant reduction in costs, and improved management of resources through partnerships.

In attracting future external support, the forestry sector developments must clearly demonstrate their contributions to poverty reduction and good management. Participatory approaches are the most promising approach seen to date in Cambodia. Placement of seed source/forest gene conservation within broader community based natural resource management provides a good example of this.

Indigenous Species Trials

The project has made several trials within the Kbal Chhay Protected Watershed to demonstrate the potential of indigenous species within tree planting programmes. Indigenous species have never before been included in tree improvement programmes, and therefore, have a great potential for improvement in quality and growth rate.

Trials to date demonstrate a number of native species as fast growing, reaching the height of man after 1.5 years, and to be adaptable to open areas, and suggests their appropriateness for use in tree planting programmes.
Economic valuation of the forest products and environmental services provided by the use of native trees clearly, latest by the CDRI 2006, demonstrate a higher value for indigenous tree species.

It is not all success!

The extent to which capacity can be immediately utilised within the Forestry Administration is unclear, as it has become evident that capacity building efforts alone have not significantly impacted on the stated overall forestry sector mandate of sustainable forest management and poverty alleviation. Whilst the Forestry Administration has a pool of knowledgeable staff the challenge is how to transfer this into practical application.
This may be elaborated by emphasis on “capacity building” rather than “capacity development”. “Capacity building” refers to the individual, whereas the “capacity development” refers to the institutions capability (including its staff). Prioritising knowledge and skills upgrading at the individual level, might have overlooked the significance of other parameters such as organisational structures, management and reward systems, market development, civil society partnerships. Only when these aspects are developed simultaneously along with the individual capacity, we can move strongly towards sustainable forest management and poverty alleviation.

Also the misconception of that Cambodian indigenous species can not grow in open plantation like condition seems to be difficult to correct. The CTSP has made plantings under 100% environmental exposure of the following species: Afzelia xylocarpa, Pterocarpus macrocarpus, Hopea odorata, Aquilaria crassna, Tarrietia javanica, Shorea vulgaris, Dip. turbinatus, Dalbergia cochinchinensis, Dalbergia bariensis Already by second season most of the plants have reached 2 meter. **This is not slow growing!** of highly valuable species for timber and local livelihoods. Now the CTSP has established a trial of 21 tree species, in repeated blocks, all in Kbal Chhay. In one-two year time this will demonstrate how various species grows in comparison. More of these tests need to be done. Se pictures below of 20 months old plantings of native valuable species.

Aquilaria crassna

Tarrietia javanica

The massive seed procurement trainings of hundreds of candidates have not in all cases had the expected effect. Today nursery managers can still be heard to say that they need seed to be delivered to them – in spite of that they have a nursery budget and have information about and been trained in mother tree selection, seed collection, seed pre-treatment and timing for collection. Such attitudes are of course obstructing development of the Forestry Sector. The question can be raised, "if training is not in turn leading to application and development then the funds and energy invested in training is lost". The solution is much more complicated and I will not here elaborate on this. Just ask the reader to reflect on upon this

Partnerships

The Cambodia Tree Seed Project has always intended to collaborate with a large range of stakeholders within natural resource management and has in many circumstances contributed to more insight into the forest sector. Transparancy of any sector will be crucial for "tomorrow" collaboration.

Good Luck

I wish to thank the many good colleagues struggling with implementing sustainable forestry for their kind cooperation. For me it has been challenged that I will look on with happiness. Finally, I wish everybody the very best of luck and happiness in the future work with natural resources of Cambodia.

Thank you very much.

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Forestry Administration/Cambodia Tree Seed Project Staff

Mr. Chea Sam Ang	Deputy Head of the Forestry Administration
Mr. So Thea	Forest and Wildlife Science Research Institute
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Mr. Hong Kim Hean	Forest and Wildlife Science Research Institute/Reforestation Office (now on scholarship)
Mr. Oun Som Ol	Reforestation Office
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Mrs. Thai Seilatina	Forest and Wildlife Science Research Institute

Annex 1 – List of Extension Materials

(Only selected examples, not complete)

Year	Extension Material	Language	
		Khmer	English
1999			
2000			
2001	Proceedings of National Priority Tree Species Workshop	X	X
	Guidelines for Establishment of Seed Orchards (*Eucalyptus* and *Acacia*)	X	
	Guidelines for Establishment of Seed Sources (*Dalbergia bariensis*)	X	
	Article on Medicinal Plant – *Cassia alata*	X	
	Guideline on Identification and Management of Seed Sources in Natural Forests	X	X
	Consultancy Report on Seed Sources in Natural Forests		X
2002	Medicinal Uses of Trees	X	
	Project Brochure	X	X
	4 posters promoting the use of good seed	X	
	Seed Biology	X	X
	Forest Gene Conservation and Tree Improvement	X	X
	Seed Source Establishment	X	
	Management of Tree Seed Sources in Cambodia	X	
	Seed Source Registration System	X	X
	Form for Seed Testing and Desiccation	X	
	Species Leaflets (8 species)	X	
	Process of Preparing for Forest Gene Conservation	X	X
	Overview of Legislation within the Forestry Sector		X
	6 Student Theses	X	
	Ministerial Declaration Model Paper	X	
2003	Medicinal Plants – Quality of Plant Processing	X	
	Safe Tree Planting Article	X	
	Study and Testing of *Shorea vulgaris*	X	
	Species Leaflets (7 species)	X	
	Farmers' Tree Planting Manual	X	X
	Safe Tree Climbing Manual	X	
	2 TV spots to promote the use of quality seed	X	
	Student Theses (participatory management of seed sources)	X	
	Web Site Information (DFW)	X	X
	Seed Collection Forms	X	X
	Seed Tests and Results (several species)	X	
	Illustrated Data Presentation of 6 Seed Orchards in Kbal Chhay	X	X
	Seed Laboratory Testing Report	X	
	Seed Sector Album	X	
	Proceedings of the Launch of the National Forest Gene Conservation Strategy	X	X
	Safe Tree Climbing	X	
	Study and Test of *Shorea vulgaris* Seed	X	
	Factors Related to Quality of Medicinal Plant Processing	X	
	Seed Calendar (poster)	X	
	GIS Based Species-Site Matching System		X
	An Assessment of Tree Seed Demand, Future Requirements and Constraints		X
	Forest Gene Conservation Strategy		X
	Ecological Zonation of Cambodia		X
	Seed Biology and Procurement	X	X
	Seed Procurement (selected species)	X	
	Species Monographs	X	X
	An Overview of Biodiversity Conservation and Reforestation Activities in Cambodia		X
2004	Eco-zones (poster)	X	X
	Glossary of Seed Biology and Tree Improvement	X	
	Video on Reforestation and Quality Seed		

	Planting Native Species	X	X
	Glossary of Forestry Terms	X	
	Costs, Benefits, and Enabling Conditions Related to Village Seed Supply Systems		X
	Many Species leaflets (additional 7 in 2004)	X	
	Species Monographs		X
	Seed testing reports (several)	X	X
2005	Guidelines for Site Identification and Tree Planting	X	X
	Partnership Concept		X
	Policy Recommendations		X
	Direct Sowing reports	X	X
	Capacity Needs Assessment of the Natural Resource Sector		X
	Status of Village Seed Source Management		X
	CTSP Website (www.treeseedfa.org)	X	X
2006 6months)	Conservation of Valuable and Endangered tree species in Cambodia – A case study		X
	Brief on Conservation of Forest Genetic Resources		X
	Forestry Regulation	X	
	Ex-Situ Trials in Kbal Chhay		X
	Review and Analysis of the Forestry Review over a Decade		X