

***“The Status of Forestry Education & Research in
Managing the Existing Forests in Cambodia's
Protected Areas.”***

By

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INTRODUCTION

- Cambodia has forestry resources that are estimated to be 58% of the total land cover (DFW 1997).
- Forests are mainly divided into two types: Dry & Edaphic forests.
- Like any other developing country its population is quite dependent on forest services.
- Under fragile conditions the forestry resources have depleted over the years.
- This has resulted in huge biodiversity loss.
- Also has increased the fragile conditions of the forestry areas to cause irreparable damage. A comparison of two tables from two different sources shown later in the presentation exhibits a remarkable decline in 27 years, *in terms of 2,411 928 ha* from 1970 to 1997.

ATTEMPTS OF RECOVERY & RESPONSIBILITY OF MANAGEMENT OF FORESTRY RESOURCES

- Attempts of Forestry recovery plans have been made under the auspices of the Ministry of Agriculture , Forestry & Fisheries & Ministry of Environment.
- Lack of vital ecological & biological information is always a challenge in the process of recovering the forestry resource.
- It soon became apparent that most of the plans were facing challenges due to absence of proper long term data of the forestry areas & scientific expertise to manage the recovery process of the fragile forestry ecosystems or conservation of the Robust forestry ecosystems. But one of the project worth mentioning is the attempt of CTSP & DANIDA.
- This environmental research which is necessary to mention here is the genetic conservation work. This was undertaken by Cambodian forestry administration (MAFF), CTSP (Cambodia Tree Seed Project) & DANIDA.

FOREST OWNERSHIP

- Forests are owned by the national Government of Cambodia & are managed by an intergovernmental working group comprising of MFFA, MOE personals. Leasing rights & concession system was introduced in 1991 & by 1997, 28 agreements were entered into by the government agency.
- The most up-to-date forest resource information for Cambodia is the 1994 Land Cover Atlas prepared by the Mekong Secretariat, Forest Register 1995 by JAFTA (Japan Forest Technical Association) and the unpublished forest cover map produced by DFW in 1997.
- Changes since then are a very likely scenario & might also have been reported but data are not available to evaluate the reports
- The total forest area of Cambodia is divided into 4.8 million ha of evergreen forest, 4.3 million ha of deciduous forest, 1 million ha of mixed forest, 0.5 million ha of secondary forest and 0.7 million ha of Edaphic forests (Kim Phat et al, 1999).

MANAGEMENT PRACTICES OF FORESTS IN CAMBODIA

- Dry land forests are estimated to be 96% of the forest cover & include evergreen, mixed, deciduous, and secondary forests.
- Edaphic forests estimated to be only 4% of include flooded and mangrove forests.
- Separate management systems are applied to these forests.
- Harvest is based on two types of selective cutting system: 25-30 year cycle (Ever green & semi ever green) & 12-15 year cycle (deciduous), (OUK, 1997).
- These systems had been in practice since 1970.

FELLING PRACTICES

- All trees that measure more than 10cm diameter at breast level are considered to be growing stock of evergreen forest with 120m³/Ha. The cutting rates for evergreen forests with slow growth is estimated to be 2.25 % /25 year sustainable rate & for fast growing trees it has been estimated to be 6.98 % / 25 yr cycle (Ashwell, 1993, World Bank et al, 1996).
- In the next slide the forest areas are given in a table according to the Mekong river Secretariat Note: Changes in classification introduced in the 1993 study are indicated *in italics* and account for a portion of the changes suggested in the original classification (Phat et al 1999).
- The table summarizes data on forestry resources till the year 1999.
- From 1973 to 1997 the forestry cover declined from 12.71 to

Area of forest by type, and change in area, 1973-1993				
Types of forest	1973	1993	Change	Annual Change
	AREA IN 000HA	AREA IN 000HA		%
I-Dry land	11,678.6	10,568.6	-1,110.0	-0.5
Evergreen	6,876.4	4,763.3	-2,111	3.1 -1.5
Deciduous	4,792.9	4,301.2	-491.7	-0.5
Mixed	977.3	977.3		
Secondary	517.0	517.0		
Pine	9.30	9.8	0.5	0.3
II- Edaphic	1,032.5	715.6	-316.9	-1.5
Flooded	937.9	370.7	-567.2	-3.0
Flooded Secondary	259.8	259.8		
Mangrove	94.6	85.1	-9.5	-0.5
Total	12,711.1	11,284.2	-1,426.9	-0.6

DETAIL INFO ON CAMBODIAN FORESTRY RESOURCES (1970-1997)					
Forest Type A	1970	1973	1985	1993	1997
<i>Dry land forest</i>	12,449,900	11,678,600	10,960,300	10,568,600	10,501,612
Evergreen	3,995,300	6,876,600	4,852,700	4,763,300	3,986,719
Mixed	2,504,000	-	1,113,000	97,300	1,505,326
Deciduous	5,296,700	4,792,900	4,367,900	4,301,200	4,056,539
Coniferous	17,800	9,300	8,200	9,800	-
Secondary	-	-	618,500	517,000	374,197
Bamboo	387,400	-	-	-	33,730
Dwarf evergreen	288,700	-	-	-	545,101
<i>Edaphic</i>	777,200	1,032,500	892,100	715,600	313,560
Flooded	681,400	937,900	795,400	370,700	219,906
Flooded secondary	-	-	28,200	259,800	20,819
Mangrove	38,300	94,600	68,500	85,100	85,100
Rear Mangrove	57,500	-	-	-	-
Total	13,227,100	12,711,100	11,852,400	11,284,200	10,815,172

WHY FOREST REASEARCH IS EMPHASIZED NOW?

- As we move into the period where the Kyoto protocol would end in 2012 & the COP15 meet was unable to create a concrete agreement on Carbon reduction & sequestration, it is going to become very important for LDCs to create their own agenda of mitigation & adaptation.
- The forestry sector has been & will be recognized as an important sector globally to aid in this process. Since the earth summit in 1992 signatories have already begun to work on this.
- Along with sustainable plan of conservation & preservation it is going to be very important to **shift** from the preservation & conservation modalities of management planning now than ever before.

CONTINUED

- The management mode must be implementation of reforestation & aforestation plans to use the carbon sinks & reduce carbon emission from degraded & destroyed forests.
- Research data & scientific investigations are priority requirements for this scenario.
- It is necessary for forestry & environmental researchers to recognize this paradigm shift & adjust their investigations to suit the demand of the period, which is especially true for a country like Cambodia.
- So far data availability for recent years is a critical lacuna

FORESTS-CLIMATE-ENVIRONMENTAL RESEARCH

- Over the recent years there has been an increased sustained interest, globally in the fate & role of the forest in relation to the climate change impacts on different geographic regions.
- However, there has been a remarkable lack of scientific data base to develop a sound forestry management policy.
- It is being recognized more & more that current patterns of existing research methodologies might prove inadequate to accurately predict the consequence of adverse factors influencing the degradation of forest habitats & management practices that are not backed by sufficient biological background of these habitats.

WHY ENVIRONMENTAL FORESTRY RESEARCH INSTEAD OF SOCIOECONOMIC PRESERVATION?

- Lack of vital information on the biotic world of forestry would cause reduced ability to enhance the ability of the forest productivity, biodiversity, & services.
- As a consequence it will also reduce human population adaptation to global climate change.
- As forestry researchers would need to adapt to this global environmental change they also would need to shift from the past goal of their conservation – preservation solutions to change into an environmental research investigation.
- Management plans would require total environmental parameter focus to come up with new solutions.
- It would be necessary to create reforestation & afforestation solutions that are close to nature influencing such a management practice.

WHAT SHOULD BE THE FOCUS AREAS?

- As we discuss the status of forestry & environmental researches in Cambodia these focuses need to be given critical priority:
- How forests & global climate effect each other? Especially from a point of view of deforestation & degradation of forests.
- How to coordinate & manage fast disappearance of endangered species creating biodiversity loss? How to correlate this event with deforestation & degradation of forest ecosystems & habitats?
- How to use forest services within a sufficient environmental know how of the different fragile forest systems & robust forest systems?

HOW TO STRENGTHEN THE FOCUS AREAS THROUGH RESEARCH?

- Under the current environmental scenario the following broader areas need to be strengthened through sustained research.
 - Broader biological knowledge of different forest layers, trees - animal interaction in fragile & robust forest ecosystems
 - Sustenance of productivity of forests & protection of inherent biodiversity
 - Designing & implementing landscape level long term experiments in both robust systems & emulation of best practice in weaker systems. Data accumulation over the years & not rapid assessments, should be focused.

CONTINUED

- Economic processes & the policy frame work that are in place to protect over exploitation in protected areas & the fringe buffer zones. Long term monitoring data should be focused on.
- Research on Scio-economic systems that are sustainable & protect forest environment should be studied in depth so that later on it could be integrated into forest management practices.
- Controlling harvesting system practice through studies & research that experimentally proves to maintain timber quality & other environmental values.

When we take a look at the research materials & resources available to understand the forestry system in Cambodia a lot of factors are seen as inadequate.

CONTINUED FOCUS

- Some researchers have done detail studies with the help of funding organizations such as JICA & UNDP.
- A lot of them might have socio - economic implication than scientific biological or ecological designs in their assessment reports.
- To understand the management of forestry from an environmental paradigm a lot more scientists have to be involved & the number of undergraduates & graduates to do research must be increased.
- Right now in Cambodia RUA/ or The Royal University of Agriculture is the only higher level institute awarding BS & MS level degrees in forestry. The average number of Undergraduate students graduating from this university in any given year is /< 111, no data was available about the graduate students .

Status of Researches & researchers involved in Forestry protection issues

- A presentation by Mr. Bun than Ngo, from RUA in 2007, showed data which showed a decline in student enrolment in 2004, & leveled off in 2006-7. Further data might be available about recent enrolment from the school of forestry.
- A discourse in creating an urgency for academia to be responsible for making contribution towards solving forestry research data base problems is necessary.
- Making an integrated, long term, research involving academia is the need of the country through a commissioning centralized body.
- Same sentiment has been reiterated by the NFP “Low individual technical and institutional capacity combined with poor public awareness is a key weakness to implementation of the NFP. In particular the lack of applied knowledge in operations and the lack of knowledge transfer from new graduates impede sustainable forest management.”
- Projects undertaken could be trans-border & international cooperation too.
- Because of the broad range of research organizations and clientele of forestry research, none of the existing forestry advisory committees have adequately met the needs of the forestry research community in general. Therefore, a policy advisory mechanism must be established to provide leadership that transcends the interests of individual organizations.

Table -3-PROTECTED AREAS IN CAMBODIA

Category	Number	Total Area (ha)
1. National Park	7	871,250
2. Wildlife Sanctuary	10	1,955,000
3. Protected Landscape (Cultural)	3	97,000
4. Multiple Use Areas	3	403,950
Total	23	3,327,200

Recommendations to overcome different forestry research oriented Problems

- The need for a centralized research organization for forestry is seen as primary to make different government agencies, other national & international agencies to use the data analysis which could be commissioned by this centralized organization to different Academic institutions.
- Funding support can be obtained through different international organization that could sponsor & support this centralized organization. This centralized organization should be represented by Government agencies, Industries with a strong inclination towards conservation of forests & its related services & Academia.
- Creation of forestry education material for the communities using forestry services by using nongovernmental organization to increase basic information regarding forests & their ecological environment. So degradation of forest habitats could be minimized.
- Encourage & direct through Ministry of Youth, Education & Sports to include basic forestry education in the curriculum at high school level. This will feed the enrolment of students into forestry & environmental research at tertiary level.
- Funding support for scientists who are actively involved in forestry research so that it would initiate other researcher's interest to do research in this field.

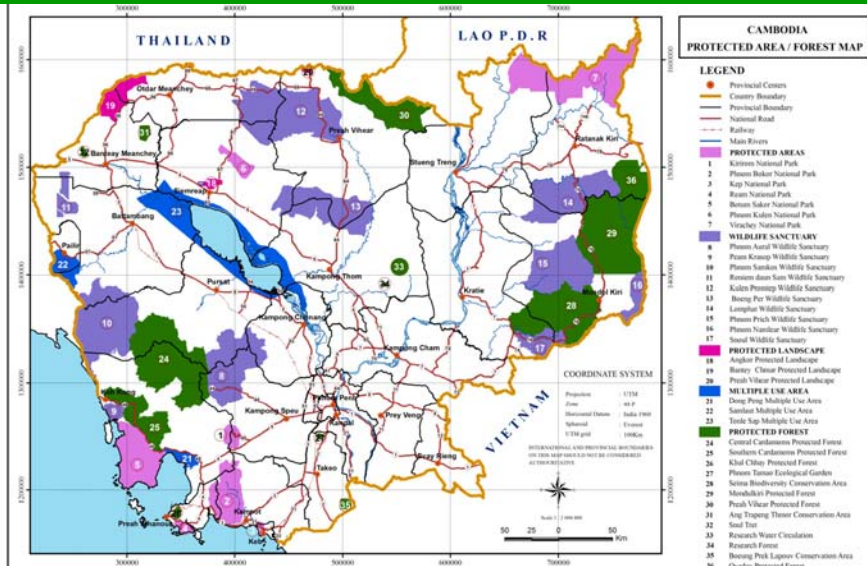
Recommendations

- A cooperative scientific research framework should be created so that there will be broader spectrum of investigation into problem areas & enhance the productivity of the participating institutions & scientists.
- This necessitates strengthening & broadening the curriculum of forestry specializations to enable graduate enrollments that would result in students doing graduate research & producing enhanced knowhow about biology, environment & ecological importance of all forests including protected forests. This will create proper management strategies of forestry services.
- Open the doors to across border scientists learning, solving & transferring knowledge about common problems of the region. This will serve for the greater good of the forestry services & help eradicate poverty through sound mechanisms of using forestry products for the community's economic development.
- Ensuring long term research grants is another way to actually increase the length & breadth of forestry investigations. Establishing competitive mechanisms to secure grants for institutes will create an interest to be involved in all areas of forestry & environmental Science

POLICY FRAME WORK SUPPORT IN THE COUNTRY FOR RESEARCH

- In order for the broad spectrum research of forestry issues to be handled with priority, the guideline of action has to be drafted by keeping in mind the existing national policies would benefit from the research & investigations that would result through such a collaboration would, make taking decisions for policy makers easier & practical.
- **THE ROYAL GOVERNMENT OF CAMBODIA and the Forestry Administration, along with Community Forestry International and Terra Global Capital, have designed the first Cambodian REDD (Reducing Emissions from Deforestation and Degradation) carbon offset credit project.**
- The project involves thirteen community forestry (CF) groups, comprised of fifty eight villages, which protect 67,783 hectares of forestland in the northwestern province of Oddar Meanchey. It **includes VCS & CCBA**. So the environmental paradigm has already taken root all it needs is more involvement from different stakeholders.

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CONCLUSION

- The above recommendations are a result of the author's own understanding & analysis of the available resources or rather the lack of it.
- These strategies if put in place will work for a country like Cambodia. Most forest scientists know that the older the forest the more sensitive it is towards climate change. So, in depth ideas are priority requirement for this country. Therefore we can conclude that it is a not the logging issues or the legislative issues that would save the most valuable forestry resources of this country but long term research projects that will reveal solutions for aforestation & reforestation issues.
- Focusing on the protected areas the author tried to get some information that deals with a broad spectrum understanding of the protected areas management with scientific data but unfortunately all resources were short term & bound to a budgetary constraint. This will not be the case when the project is interdisciplinary & long term. Which is why developed countries can refer back to 20 yeas 30 years back data.
- In conclusion I would like to draw everybody's attention to agenda 21 when "education" was stressed as the vital tool for implementation of policies. We need to explore why it has lost its glory.

***THANKS FOR YOUR KIND
ATTENTION!***