Tai Dam Funeral Forest Management can be used in REDD

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Abstract

The proposal to reduce emissions for deforestation and degradation (REDD) has widespread support from many non-governmental agencies. Problems in implementing REDD include: 1) establishing historical forest cover and composition baselines, and 2) creating culturally relevant management strategies that can be run by local populations. The Lao People's Democratic Republic is one of the first countries chosen to participate in REDD, and this ethnobotanical and ecological study proposes a way to determine historic forest cover and composition baselines as well as a way to include local villagers in management strategies. Lao funeral forests – forest fragments preserved through culturally dictated traditions – can provide a baseline for local forest cover and composition. The culturally-dictated traditions, which include forms of active forest management on the part of the village head, should be included in management regimes of these REDD projects in order to make the conservation efforts locally relevant.

Introduction

Deforestation is one of the leading causes of biodiversity loss and carbon dioxide emissions, which can contribute to climate change.[1] In 2005, a proposal to reduce emissions from deforestation and degradation (REDD) was presented to the United Nations Framework Convention on Climate Change (UNFCCC) in Montreal, Canada. Since then, the proposal has gained widespread support for its potential to mitigate climate change and preserve biodiversity by maintaining intact ecosystems, and for its capacity to support the livelihoods of local people, specifically those dependent on forest resources. While REDD has not yet been approved globally, many non-governmental organizations (NGO's), such as the International Union for Conservation of Nature (IUCN), have adopted REDD as an achievable means to reduce global greenhouse gas emissions and implement sustainable forest management practices.[2]

A common difficulty for REDD projects is the establishment of a historic baseline with which to compare deforestation or reforestation rates. Most countries participating in REDD projects have suggested that historical national deforestation

[1] United Nations Food and Agricultural Organization, Advisory Committee on Paper and Wood Products, "Reducing Emissions from Deforestation in Developing Countries: Recent Developments in UNFCCC," June 6, 2007, http://www.fao.org/forestry/12785-0cb33b433a0aa336a2edbce9a75d38f4c.pdf.

[2] International Union for Conservation of Nature, "REDD Opportunities: Integrating Sustainable Forest Management Approaches," IUCN, September 17, 2008, http://cmsdata.iucn.org/downloads/redd_opportunities.pdf

The Journal of Lao Studies, Volume 3, Issue 1, pps 15-25. ISSN : 2159-2152.
Published by the Center for Lao Studies at www.laostudies.org

rates should be included in baseline calculations.[3] Historical baselines are typically estimated from deforestation rates over the last 10 years.[4] However, many countries do not have the data to establish historical baselines. A second challenge facing REDD projects is the establishment of effective monitoring and forest management programs that will implement the conservation strategies necessary to meet REDD goals.[5] Many REDD proposals include capacity building by incorporating indigenous rights into the REDD framework. Depending on the proposal, this can take a number of forms, from employing local leaders as the overseers of reforestation projects to implement a community based compliance plan, where community members monitor deforestation rates and forest use.[6] This study focuses on the Luang Namtha region of Lao, PDR. I explore land tenure changes and deforestation rates in an effort to establish a historical baseline, as well as identify local knowledge and customs, which can help determine possible management strategies (sympathetic to local customs) that can be implemented with REDD.

In July of 2008, the Lao People's Democratic Republic – hereby referred to as Laos – was selected by the World Bank as one of the first 14 countries to receive funds for REDD through the Forest Carbon Partnership Facility, or FCPF.[7] These funds were awarded to help Laos establish baseline reference levels for emissions, implement strategies to help reduce national deforestation, and design management and monitoring systems to regulate deforestation.

In the Namtha region of Laos, the Tai Dam tribe uses forest fragments as cemeteries (hereafter referred to as funeral forests or forest cemeteries). These areas represent the last remaining intact forest in the Namtha region. The Tai Dam burn their deceased on a funeral pyre, then place the remains in a spirit house (see figure 1) built from resources in the funeral forest; over time, the remains break down and the body is returned to the forest. Only during the multiple days of the funeral ceremony can food, medicine, and other resources be collected from the forest. In addition preserving the cultural importance of the forest, a local conservation group, Green Discovery, proposed connecting several of the funeral forests in the valley with fallow land in order to create a green corridor by the end of 2010. Wildlife in the valley had disappeared over the previous 20 years, according to Green Discovery, and they hoped a new wildlife corridor would bring some of the animals and birds back into the valley.

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[3] Arild Angelsen, ed., *Moving Ahead with REDD: Issues, Options and Implications* (Bogor Borat, Indonesia: Center for International Forestry Research, 2008), http://www.cifor.org/publications/pdf_files/Books/BAngelsen0801.pdf.

[4] Angelsen, *Moving Ahead with REDD*.

[5] Angelsen, *Moving Ahead with REDD*.

[6] Arild Angelsen, Sandra Brown, Cyril Loisel, Leo Peskett, Charlotte Streck, and Daniel Zarin, *Reducing Emissions from Deforestation and Forest Degradation (REDD): An Options Assessment Report* (Washington, DC: Meridian Institute, 2009). http://www.redd-oar.org/links/REDD-OAR_en.pdf

[7] World Bank, "First Countries Named to Benefit from Forest Carbon Partnership," *World Bank, News and Broadcast*, July 21, 2008, http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:21846447~pagePK:34370~piPK:34424~theSitePK:4607,00.html.

Figure 1: A Tai Dam spirit house erected in 2004 for a female villager who died at the age of 65 (according to the tomb stone). Photo credit: Kristine Callis

The goals of this study are, first, to better understand the relationships between plant use, funeral ceremonies, and forest management (and, in doing so, to understand the local forest management practices of the Tai Dam in Luang Namtha), and second, to discover if current forest preservation or management techniques affect forest composition. While there were many limitations that decreased the scope of this study (e.g., the disappearance of a local leader, the halting of any ecological research in this area, and the vastly increased deforestation of the valley), the data collected from this study can still contribute to the nation-wide data being collected to help implement the REDD project in Laos. Studying the ecology and overall health of funeral forests will help establish forest composition baselines that can be used to establish local historic baselines for the REDD project. The ecological data collected here, while limited in scope, can contribute a baseline understanding of the ecology of the local funeral forests. Examining the ecology of these forests, including the relative abundance and distribution of biodiversity in tree species, will provide a more accurate view of the ongoing land use changes in this region of Laos. Other than the cultural taboos surrounding the forest, the management practices of the Tai Dam within these forest fragments are unknown. Understanding the management practices used in these forests may provide a mechanism that can be used by REDD project leaders in Laos to implement sustainable management regimes in remote areas and develop integrated

management practices that could be incorporated into broader REDD management plans.

Methods

This research was conducted in the Luang Namtha valley, in northwestern Laos, over two consecutive summers (2005 and 2006), under the supervision of the community development branch of Green Discovery, a regional NGO lead by Sompawn Khantisouk, and the Boat Landing, run by Mr. Khantisouk and William Tuffin. These two organizations dealt with ethical issues regarding the interviewing of local citizens, requests for permission to work in the funeral forests, the hiring of trained Lao and Tai Dam translators, and the locating of funding and resources. Further research in this area was halted due to the disappearance, and alleged kidnapping, of the primary conservation advocate working on the project, Mr. Khantisouk, and subsequently all research and conservation work on this project was halted in 2007. In January 2007, eye witnesses last saw Mr. Kahntisouk being escorted to an unmarked vehicle by men in green uniforms while on his way to the police station to discuss developments in a case involving an arson attempt on his home. Although his wife and three children have remained in Namtha, Mr. Kahnitsouk's whereabouts are still unknown.

Three villages, each with a corresponding funeral forest, reside near the Namtha River. The oldest of these villages, Ban Pong, is to the north. Younger villages are dispersed along the river due to the migration of families that left Ban Pong in order to find additional resources and space. Ethnobotanical data was collected during the summer of 2005 to determine traditional environmental knowledge, TEK, and the presence of active forest management. Ecological data – including GPS points, basal area and diameter at breast height (DBH) – were collected in both the Ban Pasak forest and the Ban Pong forest during the subsequent summer. These are the two forests that will form the capstones of the Green Discovery proposed corridor.

Figure 2: Map of the two study forests, Ban Pong and Ban Pasak. Areal image used from Google Maps.

Traditional Environmental Knowledge Study

This study used a combination of participant observation, formal (structured) key informant and informant interviews, informal (non-structured) interviews, field interviews and mapping.

From July to August of 2005, I used participant observation to collect the desired TEK data. This method allowed me to pay specific attention to important plants and their uses. Interviews were conducted in Lao whenever possible and in Tai Dam when participants did not speak Lao. For all interviews, one or sometimes two native translators from the local English program were present and spoke Lao, Tai Dam, and English. Key informant interviews – in this case, three village heads – were also important. Formal and informal interviews were also conducted with male and female village members over the age of 30. Each village has fewer than 300 members, and almost half of those are children (ages unknown). Many interviews were conducted twice, once in the villager's home and once in the forest, in order to compare answers about the quantity, quality and location of important plants. This method was used to neutralize biases in answers due to visual cues at each location. Questions were constructed to measure the villagers' ability to identify important tree species and to gauge their knowledge concerning the management and harvesting techniques for these trees. The data collected during the interviews were used to identify species important for funeral rituals and to determine how they were used. After compiling this list, I assessed the cultural importance and habitat type, as primary or secondary forest, for each species (table 1). When the plant was available, voucher specimens were collected and deposited in the herbarium at the National University of Laos, under the supervision of Dr. Somchanh Bounphanmy.

Impact Study

Forest composition was determined using nearest-neighbor plots, measuring the nearest three trees to the center of the plot, every twenty meters along every pre-existing path in each forest. While not ideal for randomized sampling, diversion from these paths was limited due to vegetation density and respect for local practices. Because of the cultural role of these forests, vegetation removal was not permitted, which limited movement away from established paths and into the dense vegetation to better stratify the plots. Nineteen plots were surveyed in the Ban Pong forest, and nine plots were surveyed in the Ban Pasak forest. The difference in the amount of plots in each forest is due to the vast difference in size of the two forests. At each plot, the diameter at breast height (DBH), a standard measurement of tree size, was measured in inches for the three trees closest to the center of the plot. In some cases, due to the dense undergrowth, only two trees were accessible in the Ban Pong forest. Basal area (BA) measurements, a standard measurement of tree density, were taken using a basal area factor 10 wedge prism, as well as GPS points were recorded for each plot; however, at some plots in the Ban Pong forest, the canopy cover impeded satellite signals and prevented GPS location determination. These GPS points were used to formulate the map of the sites (figure 2) and determine the total forested area for both forests. Further ecological data was not obtained due to the cultural taboos in harvesting from the forest and the abrupt end to the study. All statistical analyses were performed using the JMP (SAS, Raleigh, 2007) statistical software package.

Results and Discussion

Traditional Environmental Knowledge Study

From interviews with villagers and headmen, it has been determined that the estimated duration of service (i.e. the length of time a forest has been used as a funeral forest) for the Ban Pong forest is approximately two hundred years, and, for the Ban Pasak forest, between seventy-five and one hundred years. In each of the villages, the three village heads – one per village – collectively named ten trees as culturally important. Taxonomic identification was possible for eight of these plants using both the local name and samples of the trees (table 1).[8] Many of these plants have not yet been classified in academic literature and, therefore, could not be identified beyond the local common name (table 1).

Of the ten most important plants to the Tai Dam people in the Nam Tha valley, only eight were identified from either the local name or samples of the plant. The two unidentified plants are listed without a scientific name. *Dillenia indicia* is the only plant still found in the valley. The English spelling of local names is phonetic and cross-referenced with Callaghan for spelling accuracy. Informants did not know the exact Lao spelling.[9]

Table 1: Culturally important Lao plant names with possible scientific epitaph translations

Phonetic Tai Dam Name	***Possible Scientific Name (Family)***
Lho	Dinochloa pendulus (Gramineae R.)
Lum (hein)	Tamininadia ulginosa (Rubiaceae R.)
Sa	Dillenia indicia (Delleniaceae L.)
Fang	Lophopetalum wallichii (Celastreaceae)
Han	Acacia pennata (Fabaceae L.)
Kheng	Aglaonema costatum (Araceae N.E. Br.)
Peum	Dioscorea sp. (Dioscoreaceae)
Leng nan	Fissistigma sp. (Annonaceae)
Sta	Unknown
Glaut	Unknown

However, upon touring the funeral forests, the three village heads collectively identified thirty unique trees, twenty of which were culturally important (table 2, category number 1-4). According to all of the village heads, only one of the ten trees identified during the in-village interviews, *Dillenia indicia,* is still found in the funeral

[8] Mike Callaghan, *Checklist of Lao Plant Names: Lao Plants Listed by Botanical*, *Common and Regional/Asian Names with Lao Names & Lao Script* (Vientiane, 2004).

[9] Callaghan, *Checklist of Lao Plant Names*.

forest; the rest are locally extinct, but they can be found in the nearby Nam Ha Protected Area. Only one of the twelve villagers interviewed could identify more than three tree species in the funeral forest or name three culturally important trees (table 2, category number 1-4). This was true both in preliminary interviews and in field interviews.

Table 2: Compiled answers to interview questions

Category Number	Question Category	Villagers	Village Heads	Total
1	People able to identify 3+ tree types in key informant interview	0/12	2/3	2/15
2	People able to identify 3+ tree types in field interviews	1/12	2/3	3/15
3	Culturally important tree types identified in key informant interview	0	10	10
4	Culturally important tree types identified in field interviews	1	30	30
5	Trees identified in key informant interview that persist in valley	N/A	1/10	N/A
6	People who claimed conservation is important	12/12	3/3	15/15
7	People who understood the concept of protecting the forest so that it persisted into the future	0/12	0/3	0/15

Note: The first two columns refer to the number of people who responded positively to the question or subject over the total number of people interviewed (including villagers and village headmen). The third column is the sum of the two categories over the total number of people interviewed. The result is an overall ratio of positive responses. N/A indicates that that particular question or set of results does not apply to that particular group due to an absence of that question from the interviews.

Questions pertaining to conservation were met with excitement, for everyone interviewed stated that conservation was important (table 2, category 6). Further questioning revealed, however, that none of the people questioned could explain the importance of conservation or understood the long-term goals of conservation (table 2, category 7). When asked what would happen if culturally important species were no longer accessible in the forest, villagers and village heads replied that it was inevitable that important species would always be available in the forest. The Tai Dam tradition in these villages teaches that the plants are regulated by the spirits of the forest; therefore, the plants necessary to sustain Tai Dam life will always be available, if not in the funeral forest, then elsewhere in the valley. It is important to note that when asked which species were important, village heads acknowledged that most culturally important

species were no longer found in the valley. When probed about what could have contributed to the local extinction of these species, the answer was always that spirits – not humans – controlled such things. Thus, in their view, the demise of culturally important species in the forest did not have any connection to the absence of conservation practices. To analyze the Tai Dam understanding of conservation, the importance of conservation, and the impact of conservation on their lives, the study included a series of questions involving scenarios in which conservation was not implemented in the valley (table 2, category 7). These questions included inquiries about what would happen if the river – which already juts into the forest and causes several trees to fall into the river every year – moved further into the forest? Answers included a number of solutions, such as digging a new path for the river to follow so as to protect the forest, or praying to the spirits of the forest to move the river. When asked what would happen if the government wanted to cut a road into the forest, respondents indicated that the villagers would form a line to protect the forest. In fact, local rumors indicated that protests in front of a neighboring forest had successfully protected the forest from a road construction crew.

While most villagers are unaware of active forest management or the need for conservation, interviews revealed that the head of the village functions as the principal forest manager. In this capacity, he tries to ensure that the diversity of tree species is conserved. The village head of Ban Pong tracks tree species' populations and allows the harvesting of select trees with adequate representation in the forest. However, the village head of Ban Pasak does not actively pick which tree species seem to be abundant or in decline and, therefore, allows villagers to cut any "small" trees during a funeral ceremony. During a funeral ceremony, trees can be cut down to make the spirit house and cemetery plot for the deceased (see figure 1). With permission from the headman, medicinal and nutritional plants can also be collected during this time. Additionally, the cultural practice of only removing plants from the forests during a funeral ceremony limits harvesting. Thus, the historical conservation of funeral forests is determined by both direct management and cultural practices.

Impact Study

Data were analyzed using Welch analysis of variance (ANOVA) in order to compare the means of the two forests and compensate for the unequal standard deviations. Both the basal area (P=0.0047) and the DBH (P=0.0237) of Ban Pong and Ban Pasak were significantly different when $\alpha<0.05$ (figures 2 and 3). These results support personal observations that the vegetation in the forests appeared to be quite diverse. The ground cover in the Ban Pong forest was approximately 1-2 meters tall and thick enough to prevent movement through the forest. In contrast, the Ban Pasak forest had almost no ground cover and lacked a distinct litter layer, possibly due to frequent flooding of the forest. Additionally, the Ban Pong forest appeared overall to have larger, taller trees, which is supported by the difference in DBH (table 3).

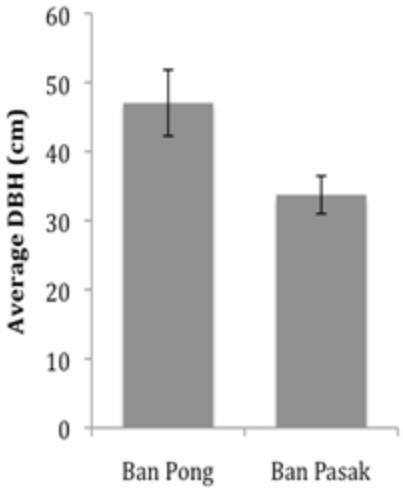

Figure 2: Average DBH of all plots in each forest. Error bars represent the standard error.

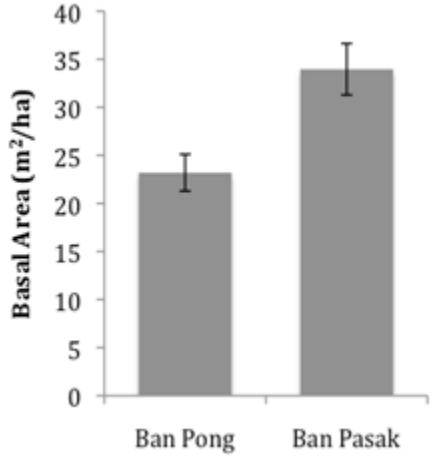

Figure 3: Average BA of all plots in each forest. Error bars represent the standard error.

Table 3: Summary of forest dynamics

Forest	n (# trees)	DBH (cm)	n (# plots)	BA (m^2 ha^{-1})
Ban Pong	40	47.04 ±4.79	19	23.20±1.91
Ban Pasak	27	33.74 ±2.73	9	33.96±2.672

Note: Averages of DBH and BA include ± 1 SE (standard error).

Based on DBH and BA results, the Ban Pong forest is less dense, with larger trees than the Ban Pasak forest. If these results can be attributed to active management, then they should be correlated with the duration of service. According to the villagers, each forest is used once every 1-3 month(s) for funerals. The frequency of usage depends on many health factors, such as the spread of disease and the age of the human population. There are no written records of when each ceremony is conducted. Although the date of death is written on the spirit house, these dates are lost with the decay and collapse of the house. While these management practices have not preserved all of the most

important trees used by the Tai Dam people in the Namtha valley, management has shaped a forest with a low density of larger trees.

Conclusions

The differences in the distribution and size of trees in the two funeral forests considered in this study may be attributed, in part, to the management styles of each village head. The Ban Pong village head actively manages the funeral forest for declining populations of tree species, and this is reflected in the greater variation in tree diameter and the thinning of trees in the forest. Further research would need to be done to catalogue the tree species in both forests to determine if the active management practices used in Ban Pong maintain higher biodiversity than those used in Ban Pasak.

While limited in scope, the DBH and BA recorded for the funeral forests in the Namtha valley provide a historical reference to set a possible baseline for Laos. With the origin dates of these forest fragments established well beyond the 10-year mark usually used to set REDD baselines, the recorded composition of these forests can provide a historical baseline for tree diversity and density in the Namtha valley. In the years following completion of this study, the mountains surrounding this valley were severely deforested in order to establish rubber plantations. By using the observed composition of these two forested patches as the baseline for this location, conservation efforts can work towards restoring the surrounding forest. Hopefully, further work will continue in this area in order to adequately compare the ecology of the funeral forests.

Using pre-existing management practices incorporates local leaders into the conservation effort, which can strengthen the possibility of successful reforestation.[10] For both the remaining forest fragments in the Namtha valley, as well as for future restored forest in the surrounding areas, the culturally established management practices identified in this study can be incorporated into a larger, coordinated management effort within the region. Village heads who actively manage the funeral forests may be able to effectively train village heads who use a more limited management role. Additionally, incorporating local leaders and their management practices can help to maintain biodiversity as well as carbon stores, since local communities value the biodiversity of culturally and environmentally important plants.[11] Considering that poor forest regulation and deforestation have resulted in the global emission of 1.6 billion tons of carbon dioxide, it is clear that finding effective management strategies is essential to the success of REDD.[12]

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[10] International Union for Conservation of Nature, "REDD Opportunities."

[11] International Union for Conservation of Nature, "REDD Opportunities."

[12] Robert T. Watson, Ian R. Noble, Bert Bolin, N. H. Ravindranath, David J. Verardo, and David J. Dokken, eds. *Land Use, Land-Use Change, and Forestry: A Special Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2000). http://www.ipcc.ch/ipccreports/sres/land_use/index.php?idp=0.

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