

REAPING THE REWARDS OF REFORESTATION

by Stephen Elliott with photos by David Blakesley

However, maybe the outlook need not be so bleak. Working with Chiang Mai University's Forest Restoration Research Unit (CMU-FORRU), Hmong hill-tribe villagers in the north of Doi Suthep-Pui National Park are showing that *tropical deforestation can be reversed*. Moreover, they are achieving success in a small valley with a rapidly growing population. Now, the villagers are beginning to reap the rewards of their hard work, as they prepare to invite ecotourists to enjoy their newly restored forests.

With more than 200 households, the village of Mae Sa Mai, is the largest Hmong hill tribe community in northern Thailand. The village's growing population is bringing enormous pressure to bear on the valley's natural resources; yet, the community has actually increased forest cover in their watershed since 1996. Native forest is again thriving on degraded land above the village. Where cabbages and carrots once grew, wildlife is now returning.

In the past, the Hmong traditionally cultivated corn for animal feed, upland rice as their staple food and opium poppies for a cash income. Although highly controversial, poppy cultivation had low ecological impact.



In a world with a rapidly increasing human population, it seems inevitable, that tropical forests will continue to be destroyed to meet the ever-growing needs of humankind. If so, then we must also accept that a substantial proportion of Earth's biodiversity will disappear, since tropical forests are habitat to more than half the world's plant and animal species.

- Above left:* The village of Mae Sa Mai nestles below the last patch of original forest in the valley. This protects the village's water source.
- Middle left:* In a religious ceremony, villagers give thanks to the spirits for a successful fire prevention programme.
- Middle right:* A Hmong girl pots a tree seedling at Ban Mae Sa Mai's community nursery. Her future may very well depend on the tree's survival.
- Below right:* Village youngsters hold a trophy, awarded by the Royal Forest Department in 2000 for care of planted trees.



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Because opium was so profitable, each family would clear only a tiny patch of forest to meet their needs. However, the social costs of drug addiction meant that poppy cultivation had to be eradicated. In the 1980s, drug suppression programmes promoted alternative (but far less lucrative) cash crops. The villagers had to clear most of the remaining forest to earn the same income, sparing only the tiniest remnants on the steepest slopes. In the dry season, wildfires scorched the earth, whilst during the monsoon, torrential rains stripped cultivated slopes of topsoil and clogged streams with silt. Consequently, the community's water supply dried up, so the villagers had to shift their settlement down the valley, where three streams still flowed from a surviving forest fragment. They began to realise that conserving this tiny watershed forest was vital for their survival. Another significant development came in 1981, when the valley was declared part of Doi Suthep-Pui National Park. To avoid eviction from the park, the villagers would have to prove to the authorities that they could take care of the environment.

A few families formed the Mae Sa Mai Natural Resources Conservation Group. One of their first steps was to develop rules to conserve the remaining forest that protected the village water supply. Villagers who cut trees or hunted animals in the forest were fined by the village committee and destructive activities rapidly declined. The conservation group painstakingly built a community-wide consensus to gradually reduce cultivation of the upper watershed and replant the area with forest trees to celebrate the King's Golden Jubilee. For more than 30 years, the village had received Royal assistance to grow lychee orchards in the valley bottom, as well as coffee and vegetables. To compensate for agricultural land taken out of production and to raise average incomes to 100 baht/person/day, the villagers set about increasing the productivity of their lychee orchards and other crops. Initial efforts to restore forest to the upper watershed were largely unsuccessful, so when the villagers heard about FORRU, through the national park authority, they asked the unit to help.

FORRU was founded in 1994, to develop appropriate techniques to restore natural forest ecosystems to degraded sites, for wildlife conservation and watershed protection. Initially, the unit carried out basic ecological studies of many of Doi Suthep's more than 680 indigenous tree species. Seasonal flowering and fruiting cycles of nearly 100 species were recorded and germination tests were carried out on more than 400 species. Working with Britain's Horticulture Research International (HRI), experiments were carried out to develop efficient methods to grow indig-

enous forest tree species from seed to a suitable size for planting.

FORRU started to develop the "framework species" method of forest restoration. Framework tree species are those that accelerate natural forest regeneration, when planted out on degraded sites. They must survive and grow rapidly under harsh conditions and must rapidly shade out weeds. The planted trees restore forest structure and function, but they also accelerate biodiversity recovery, by producing, at an early age, foods, nesting sites or other resources, which attract seed-dispersing wildlife. Plants that grow from the seeds, which are dispersed into the planted areas by wildlife, gradually restore the original forest flora.

The next step was to find field sites where potential framework tree species could be tested. Therefore, when the park authority asked FORRU to help the Mae Sa Mai villagers reforest their upper watershed, the opportunity arose to combine the needs of science with those of a local community. The villagers also asked FORRU to help them establish their own tree nursery, so FORRU sponsored construction of a village tree nursery and helped to train some of the villagers to run it. This community nursery enabled FORRU's researchers to determine if villagers, with no scientific background, would accept propagation techniques that had been developed in the research facility. Feedback from the villagers provided plenty of ideas for further research.

By 1997, the project was ready to start field trials of the framework species method in earnest. Each year, with the support of Thailand's Biodiversity Research and Training Program, and now with sponsorship from Britain's Eden Project, plots are planted to test various mixtures of 30 candidate framework tree species. The plots include experiments to test how the planted trees respond to different weed-control, fertiliser-application and mulching treatments. Since the experimental plots are fairly small, the villagers also plant larger areas as a community activity.

The biggest threat to the planted trees is fire in the dry season, so in mid-January, every family in the village helps cut firebreaks around the plots and joins fire-fighting teams until the monsoon rains begin. The villagers regard fire prevention as such an important activity that they implore their guardian spirits for good fortune at the start of the fire season. If the fire prevention programme is successful, the spirits are thanked, at the start of the monsoon, with an elaborate religious ceremony, involving the sacrifice of a pig.

By the end of the second rainy season after planting, the trees grow tall and canopy closure begins to occur. The villagers assess the success of their hard

work by joining with FORRU staff to measure the planted trees. They also record the return of the forest flora and carry out monthly surveys to record which trees have started to attract animals into the plots with flowers or fruits.

So far, the results are promising. By 2-3 years after tree planting, hot, dry degraded areas, dominated by weeds, are transformed into cool, shady forest with a thick carpet of leaf litter. Some of the tree species planted grow up to 7 m tall, just 18 months after planting, and wildlife such as hog-badgers, wild pigs, deer and a host of forest birds return.

As news of the project's success spread, an initial trickle of inquisitive visitors grew into a steady stream. Now, whenever guests arrive, members of the village conservation committee turn out to explain why their community has become so deeply involved in forest conservation. The links between quality of the environment and standard of living, which are now obvious to the villagers of Mae Sa Mai, often require patient explanation to visitors. The villagers seem proud that their community is fast becoming recognised as a model by a wide range of organizations. In 2000, Ban Mae Sa Mai played host to an international conference on 'Forest Restoration for Wildlife Conservation'. Since then, visiting groups have included radio journalists, foresters, students, NGOs, teachers, government officials, and the regional Hmong Youth Association, among many others.

Now the villagers are developing their own eco-tourism programme. With assistance from The Royal Project, an eco-tourist centre is being built and programs developed to enable visitors to experience both the natural and cultural attractions of the Mae Sa Valley. Visitors will stay in a small lodge, currently under construction in the village, and enjoy a wide range of activities, including forest walks, bird-watching and star-gazing in a sheltered camp site amidst the planted trees. A ceremony to launch the programme took place in November.

The Mae Sa Valley lies about an hour's drive northwest from Chiang Mai. Access is via a dirt track, which ascends the valley from Pongyang on the Mae Rim - Somoeng highway. A 4WD vehicle is recommended. Prospective eco-tourists can telephone Kuhn Vinai Phusiripathananon (09) 560-5100 or Kuhn Manas Thanonworakul (01) 783-9437 to arrange their programme.

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The writer is a long-time Chiang Mai resident and author of *The National Parks and Other Wild Places of Thailand* by Stephen Elliott and Gerald Cubitt, distributed by Asia Books and available in most Chiang Mai book stores now.