Better forests, better water, better lives

The Livelihoods and Landscape Strategy (LLS) in Doi Mae Salong, Northern Thailand

Tackling poverty through environmental restoration in Doi Mae Salong © IUCN / Carolin Kugel

Summary

The LLS initiative represents a new way of thinking – from focusing on threats, to promoting negotiated plans for productive landscapes. An LLS provides for immediate needs while supporting long term changes that will improve human wellbeing and resilience.[1]

Doi Mae Salong (ดอยแม่สลอง, in Thai: “doi” = mountain; “mae” = water) is located in the very North of Thailand, in the outermost foothills of the Himalaya (Mae Fa Luang District, Chiang Rai Province), bordering Myanmar and Laos. The highlands of Northern Thailand constitute the headwater for large parts of the central Thai provinces and play an important role in the provision with sufficient and clean water to downstream users.[2]

The area has witnessed many stages of land use transition including extensive deforestation, caused by a number of factors, including increasing population pressure and expansion of agriculture onto steep slopes.[3] In 2007, the Royal Thai Armed Forces (RTAF) initiated a reforestation project in honour of H.M. the King Bhumibol Adulyadej’s 80th birthday. However, the project was implemented in a typical top-down approach, which led to protests. As

[1] Reference (3)

[2] Reference (6)

[3] Reference (5)

Buitenlandse Zaken
Ontwikkelings
samenwerking

a quite unusual act, the RTAF subsequently approached IUCN for advice about more effective approaches to conservation.[4]

In cooperation with a range of partners, LLS has been implemented in Doi Mae Salong since 2007. It focuses on three overall objectives:[5]

1. **Governance[6]:** Promote effective governance practices and stakeholder interaction
2. **Forest Landscape Restoration:** Strengthen environmental planning by supporting stakeholder participation, while building local capacity to make informed choices about restoration and protection.
3. **Poverty Reduction:** Identify and develop policy and practices that can benefit the poor.

Participatory governance practices have come into effect. Agricultural practices, which leave more land for reforestation while sustaining local livelihoods and restoring the watershed's ecological functions, have been implemented.

The Landscape

Until the mid-20th century, Doi Mae Salong was in large parts covered by a mix of rainforest, dry evergreen forest and deciduous forest. However, decades of forest clearing for agriculture and settlements brought about a highly fragmented landscape. Today, patches of original forest, degraded forest, grasslands, bamboo forest, recovered forest, rice and corn fields, terraced paddy fields, tea and coffee plantations, orchards, flower gardens and vegetable plots are scattered over the mountain range. While the hilltops are covered in remnants of green forest, the slopes are used for crop cultivation, and forest patches are a scarce sight. Crops grown include rice, corn and perennial crops such as fruit trees.

The watershed is a tributary to two rivers, which feed into the Mekong River and are the main water sources for household consumption and agriculture in the area.[7] The entire watershed compasses an area of 335 km^2. The core area, in which the LLS project is implemented, covers an area of 90 km^2 and is inhabited by 15,000 people. LLS works with 13 villages in the core area.

Akha woman in traditional dress © IUCN / Carolin Kugel

Chinese Thai make up almost half of the population in the project area. Apart from Mian, ThaiYai (Shan) and local Northern Thai, **Lisu**, **Lahu** and **Akha** are the three main **hill tribes** who live in the core area of the site.[8] **Economically**, Doi Mae Salong is a poor area. Average cash income ranges from about 30.000 to 50.000 BHT/year.[9] The main **sources of income** are agriculture, daily wage labour and, to a minor degree, trade.[10]

Due to its location in a border area, the entire project site is part of a military reserve area under the control of the Royal Thai Armed Forces (RTAF).

Challenges and Achievements

(1) Governance:

When RTAF asked IUCN and others for help in 2007, the biggest challenge was to improve the governance of the reforestation attempts. The RTAF's top-down approach to selecting sites and species for tree planting was replaced by a participatory decision making process that focused on poverty alleviation through resource enhancement and restoration using assisted natural regeneration techniques. The most fundamental step towards effective governance was therefore the establishment of a **multi-stakeholder platform**. It provides a basis where villagers, RTAF, IUCN, local NGOs and government agencies can discuss ideas and solutions to regain environmental security and sustainability in the region. This bottom-up approach can prevent conflicts and is expected to keep the land use management system in Doi Mae Salong sustainable in the long term.

[4] Reference (2)
[5] Reference (3)
[6] Governance is the interaction of laws and other norms, institutions and processes through which a society exercises powers and responsibilities to make and implement decisions affecting resources and to hold decision makers, implementers and resource users accountable.
[7] Reference (6)
[8] Reference (4)
[9] Reference (1)
[10] Reference (1)

(2) Forest Landscape Restoration:

Forest was historically cleared on a grand scale. Tea plantations were constructed and farmers cleared land in need for additional land to grow food and sustain their livelihoods. Due to land scarcity, newly cleared areas were inevitably located on steep slopes. However, especially during the heavy tropical rainfalls, farming on steep slopes bears a high **risk of erosion, landslides and floods in the lowlands**. Deforestation alters **hydrological flow regimes**. In a deforested landscape, runoff volumes after heavy rainfalls are higher than under forests, and the water is delivered to the rivers more quickly as infiltration rates drop. This implies that ground water levels sink and the risk of rivers to run dry in the dry season is higher. As the Northern Provinces are a main water source in Thailand, deforestation impacts livelihoods far beyond the local scale. The lowlands of the Doi Mae Salong watershed went through several severe floods in the last decades. Hydrological instabilities in the watershed's highlands caused the loss of infrastructure and flooded fields in the lowlands. Furthermore, the increased sediment load impairs the water quality.

Village life © IUCN / Tawatchai Rattanasorn

Hill tribe people in Doi Mae Salong traditionally practice **shifting cultivation**. This technique requires large areas of land to retain soil fertility in the long term. It is therefore only suitable on sparsely populated areas. In densely populated Doi Mae Salong, new farmland has become sparse and the indispensable fallow periods cannot be warranted anymore. Fields are becoming exploited and as a consequence **lose their fertility**.

Another consequence of deforestation is the reduction of **forest connectivity**, which is likely to lead to the **loss of biodiversity**. Most animal species need a continuous territory of a certain size to find enough food, shelter and nesting places. If their habitat – the forest – is logged, these species disappear along with it. Apart from the biological loss, a large number of forest species have a spiritual meaning to the hill tribe people. Many aspects of **hill tribe culture** are based directly on the natural environment and cannot be sustained without the forest.

As the loss of forest cover and the impairment of the landscape's hydrology are closely linked, solutions to restore the hydrology of the watershed have to take both factors into account.

Communal tree planting day © IUCN / Tawatchai Rattanasorn

- ***Reforestation***

In cooperation with the Forest Restoration and Research Unit of Chiang Mai University (FORRU), the Royal Forest Department (RFD), the Hill Area Development Foundation (HADF) and supported by the Plant A Tree Today (PATT) Foundation, several **reforestation sites** were launched, covering a total area of 600ha. A variety of suitable species are planted on demonstration plots. The composition of tree and shrub species follows the concept of the *Framework Species Approach*. Plant species are chosen according to the roles they fulfil in an ecosystem. The choice of species covers a wide range of ecosystem functions to ensure the newly planted plot resembles best a natural forest and is ecologically resilient.

Bamboo worms as a non-timber forest product © IUCN / Carolin Kugel

Due to the dense population, there is only limited land available for reforestation. Instead, agricultural practices have been intensified to leave more land

for forests, and the implementation of alternative farming practices has been encouraged. Forests on hilltops and on riversides are to be connected again, while agriculture is intensified in the flatter areas.

- ***Adapting agricultural techniques:***

  Contours and alley cropping: Contour lines were dug on steep fields. Along these lines, farmers plant permanent crop species, mostly trees like macadamia nut, jackfruit, mango, banana and avocado. The space between the lines is used to plant annual species, like dry rice and corn. This measure enhances infiltration rates and biodiversity on the field and prevents erosion of fertile soil.

Contour lines on a steep slope © IUCN / Carolin Kugel

  Construction of rice paddy terraces: Through improved irrigation systems and the ability to diversify crop production in the terraces (soy bean, garlic, sesame and vegetables can also be grown), these paddies produce a significantly higher yield per unit area than shifting cultivation, so that a larger area is available for Forest Landscape Restoration.

  Reduce the application of chemical fertilizers by providing knowledge about the production of organic fertilizer through vermiculture (worms) (in cooperation with Mae Fah Luang University)**:** The Red Wriggler (*Eisenia fetida*) is a worm native to the tropics, where it lives in the soil. Through its digestion process, it very effectively decomposes biodegradable matter. To use the worm more efficiently, villagers cultivate it in tanks. The worms are fed with organic matter like the leftovers on agricultural fields after harvest and organic household waste. Within a short time, the worms turn the "waste" into high value humus, and villagers use the final product to fertilize their fields.

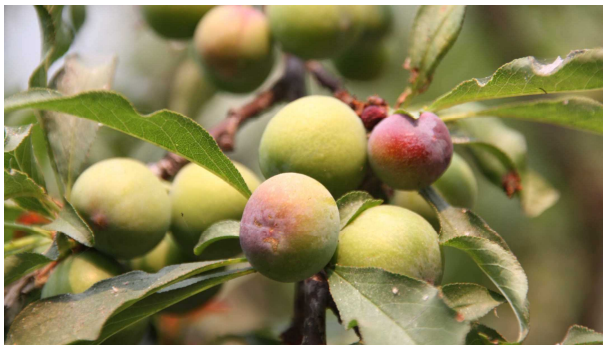
- ***Rethinking the choice of crops and trees in agricultural land:***

  Permanent crops: Local farmers are encouraged to count on trees as permanent crops, rather than on shifting cultivation. Permanent cultures provide an all season canopy, which decelerates rainfall and thus abates erosion and reduces run-off, while the strong roots hold the soil. Also, permanent cultures do not require tillage, so the soil is less susceptible to erosion.

  Agroforestry: This concept targets areas that cannot be fully reforested due to land scarcity and high population pressure. A mixture of carefully chosen cash crops and indigenous forest species, which best resemble the original forest, are planted on the plots. Farmers choose from a wide range of fruit trees that can be harvested.

  The choice of cash crops ensures that the agroforestry plots yield enough profit for local villages. Reforestation is therefore not associated with land loss, but rather with income generation.

  Allocating land for agro-forestry purposes and utilizing it within its capacity, yet supporting significant income generation leaves more land available for forest restoration. Poverty alleviation is thus linked with improved natural resources management.



Plums © IUCN / Carolin Kugel

Coffee beans on shrub © IUCN / Carolin Kugel

- ***Educating younger generations about the value of forest biodiversity:***

  With support from the PATT Foundation, eight local schools started providing training in tree nursery techniques. Children learn on-site about seed germination, potting trees, taking care of trees in the nursery, as well as tree planting and aftercare. This

direct experience with forest species raises awareness of the biological diversity of local forests, the potentials of the different species and the benefit of forest diversity for people and the entire ecosystem.

(3) Poverty Alleviation:

Many hill tribe families farm primarily for their own subsistence and sell only a fraction of their farm products. Therefore, cash income is very limited. Certain goods and services stay out of reach.

Poverty alleviation in the hill tribe villages through the generation of alternative sources of income. LLS supports villages who attempt to establish **nature- and community based tourism**. Community-based tourism involves not only certain households, who actually host visitors, but the whole community (village). Families who do not have the facilities or capacities to host visitors can integrate themselves by guiding tourists on nature treks, offering handicraft workshops or by cooking meals. A certain share of the income from tourism activities is delivered to the village fund and is used for purposes of common interest, e.g. improving a road or a water pipeline.

Another advantage of earning cash income is spread of risks. If a bad harvest causes a shortage of one product, families might still be able to buy it from traders on the market instead.

IUCN's partners in Doi Mae Salong are:

Royal Thai Armed Forces (RTAF); Plant A Tree Today Foundation; Land Development Office of Chiang Rai; Royal Forest Department; Department of Water Resources; Community Development Department (CDD); Department of Agricultural Extension; Department of Fisheries; Department of Local Administration; Mae Salong Nok Tambon Administration Organization; Patung Tambon Administration Organization; Hill Area Development Foundation (HADF); Mae Fah Luang Foundation; Chiang Mai University Forest Restoration Research Unit (FORRU); Royal Project Foundation; Highland Research and Development Institute (HRDI).

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Coffee propagation training © IUCN / Tawatchai Rattanasorn

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