WORLD AGROFORESTRY A model of sustai-nable agroforestry IN PRACTICE

system in wet tropical conditions



AUTHORS Emmanuel Torquebiau **LOCATION** Asia, Sumatra **ORGANISATION** CIRAD **TYPE OF PRACTICES** Arboriculture **PRODUCTION** Resin

GENERAL CONTEXT

The multistrates agroforests from Sumatra are planted by villagers for the production of "damar" resin obtained by the tapping of the tree species Shorea javanica. Resin is consumed locally as well as exported. During the growth stage of the Shorea javanica (at least 20 years), the farmers can associate a wide range of other useful species (coffee, clove, fruit trees). The culture cycle begins by the exploitation of a natural forest (or an existing agroforest), then comes a rainfed rice cultivation and eventually the introduction of new Shorea trees. After 10 years, the agroforest will look like a natural forest and will host a rich biodiversity.





ENVIRONMENTAL 2 **CHARACTERISTICS**

Most of the agroforests are situated at 5° South, where the climate can be described as equatorial and hyper humid: 3000mm of rain yearly, no dry season and a mean temperature of 25°C with less than 2°C amplitude. The soil is of a volcanic type with a good cation exchange capacity (CEC).

HISTORY

Several resinous tree species were traditionally harvested in natural forests and used for torches, clogging material and various handicrafts. In the 80s Damar plantations are identified as agroforests and displayed on the Sumatra's vegetation map, reaching about 55 000 hectares.

DESCRIPTION AND INTEREST

The damar plantations' structure is very similar to natural forests': very tall trees, high biodiversity, shadowed underwood...many characteristics that shows the resilient and sustainable nature of this agroecosystem, capable of providing food for subsistence as well as cash crops. The landscape of the region ends up very multifunctional with the spatial and temporal association of these agroforests with natural forests, rice fields and itinerant farming plots.



These agroforests are an example of good collective management of the natural resources, which has been acknowledged by the Indonesian government in the year of 1998. After several studies and thanks to the scientific sphere lobbying, the Indonesian Forest Ministry created a special classification category for the agroforests, showing its social and environmental values as well as regulating the harvest rights for locals.

TREE SPECIES

When the agroforest is fully developed, the main tall species is the *Shorea javanica*, associated with some fruit trees (like the durian fruit, *Durio zibethinus*) or spontaneous tree species retained for the quality of their timber. Under the canopy strata, various strates are occupied by fruit trees and shrubs like duku (*Lansium domesticum*), mangosteen (*Artocarpus heterophyllus*) or the rambutan (*Nephelium lappaceum*). Before the maturity stage of the agroforest, the damar trees are associated with coffee (*Coffea spp.*) and cloves (*Syzigium aromaticum*).



5 STAKEHOLDERS AND CHALLENGES

Even if the real estate pressure is intense in South Sumatra, damar agroforests were maintained because they are perceived as a land guarantee by locals (although they often don't have ownership titles). However, it is important to monitor their exploitation to ensure that harvests are always made with the intention of planting a new cycle, and will not result in a pure degradation.

PRODUCTS AND USES

Resin is the main production of the system, it is mainly exported and sold on international markets as a component for cosmetics, paints or varnishes. During the sequential stages before the maturity of the agroforest, numerous productions are harvested gradually like rice, coffee, cloves, then arrives resin and fruits or other edible tree products (leaves, roots, etc.). Fodder is also harvested or medicinal products.

B LANDSCAPE MANAGEMENT

The installation of these agroforests makes part of an effort of stabilization of the itinerant agriculture, contributing in the protection of tropical rainforests. The multifunctional landscapes created by theses practices are a remarkable example of good combination of agricultural, forestry and biodiversity objectives. With its dense structure, close to the natural forests, the damar agroforests play a key role in mitigating climate change, mainly by sequestrating carbon.

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