

Damar Resins, from Extraction to Cultivation : An "Agroforest Strategy" for Forest Resource Appropriation in Indonesia

Geneviève Michon, Hubert de Foresta¹ & Arit Alladi²

Farmers of the forest margins all over the archipelago of Indonesia have conceived remarkable agroforestry systems which associate ancient forest management systems with a logic of commercial agriculture, and established typical forest structures in agricultural lands. As pure forest reconstruction enterprises, Indonesian agro-forests, besides their agricultural qualities, should be understood as an original appropriation strategy of forest resources by local communities which allows to escape the contradiction existing between an institutional framework which sharply limits their access to natural forests and an economic reality which pushes towards intensive utilization of their resources.

Keywords: Damar resins; Agroforest; Indonesia

Introduction

In Indonesia, debates on global modes of forest resources utilisation and conservation are still dominated by a negative perception of indigenous people by decision-makers as well as national scientists. Actual conditions of utilisation and management of these resources are never encompassed in a critical and non-partisan way. Positive examples of indigenous management are either under-estimated or misunderstood.

In this context, the study of agroforestry management of forest lands and resources by Indonesian farmers appears essential: farmers of the forest margins all over the archipelago have conceived remarkable agroforestry systems which associate ancient forest management systems with agricultural lands.

History of Resin Harvesting: From Extractivism to Cultivation in the Pesisir

Dipterocarp resins, collectively known as "damar", are, together with other resins, among the oldest traded items from natural forests in Southeast Asia. Before the 19th century, they were traded as bases for incenses, dyes, adhesives and medicines, but also locally served for caulking

and lighting purposes. The first damar exports to Europe and America started at the beginning of the last century, with the development of industrial varnish and paint factories. Between 1895 and 1920, harvesting of damar was a main income-generating activity for many communities in Sumatra and Borneo.

Since the end of the last century, the southernmost province of Sumatra, Lampung, and specially the "Pesisir", a hilly-mountainous area stretching north to south along the western coast, gradually emerged as the main damar producing area in Indonesia. Today, Pesisir produces more than 80% of the damar resin traded in and from Indonesia. The bulk of the Pesisir damar is provided by a single species: *Shorea javanica* K & V.

Until the end of the 19th century, farmer communities in the Pesisir mainly relied on collecting wild damar from the forest. The high increase in resin prices after 1850, with new industrial markets, entailed intensification of tapping which made the damar a rare and almost non-renewable resource.

Quarrels and conflicts for appropriation of damar trees, similar to those presently encountered

¹LORSTOM/ICRAF, Jln Gunung Batu, P.O. Box 161, Bogor, Indonesia.

²LATIN, Fak. Kehutanan, IPR, Darmaga, P.O. Box 69, Bogor, Indonesia.

in Indonesia concerning the access to common property resources, such as rattan, gaharu or ironwood, burst between and even inside village communities³. In 1935, a Dutch forester visiting the area reported total exhaustion of the wild damar resource.

But in the same period, damar plantations started developing, which boomed after 1930. As population was growing probably the problem of rice also arose very soon. Increasing market strategies to obtain rice was probably another reason for sudden extension of damar cultivation.

In 1935, there were 70 ha of productive damar gardens, and production doubled from year to year. In 1994, mature gardens covered more than 10,000 ha, and young plantations another thousands of hectares which will turn productive in the next 10 to 20 years. 57 out of 70 villages of the region, and more than half of the total active population of the area, are fully involved in damar production.

Damar Gardens: A New World, between Forest and Agricultural Plantation

Damar story in the Pesisir constitutes a highly original process. Originality is, that, while cultivating the damar tree, villagers have created forest resource in the middle of agricultural lands.

Resource Appropriation: How the control of a forest resource leads to re-appropriation of the forest itself.

The technical control of damar

Forest re-appropriation in the Pesisir starts as a specialized plantation process aimed at con-

trolling the damar resource. Pesisir villagers have succeeded in what most foresters dream, but fail: establishing, maintaining and reproducing, at low costs and on huge areas, a healthy Dipterocarp plantation. It is indeed through *ladang*, the field opened in the forest, for dry rice, coffee or pepper, that damar trees have been reintroduced in the landscape. Introduced in the *ladang* below coffee bushes, pepper vines and their shade trees, damar seedlings find a suitable environment to establish. After the abandonment of the coffee or pepper stand, damar trees appear strong enough to grow along with secondary vegetation and overcome competition with pioneers. The subsequent fallow can freely develop until damar trees reach a tappable size. In terms of silviculture, this process of establishment of tree plantation represents an early and great innovation⁴. Besides its ecological advantages, this process is suited to a small land-holder. It utilises the site preparation already done for *ladang*, implies minimal additional labour and capital and can be carried out along with the activities related to *ladang* crops.

Restoring a forest ecosystem in its entirety

Mature damar gardens are not monospecific plantations; they assume the same patterns of diversity and heterogeneity as does a natural forest ecosystem⁵. This "forest reconstruction" is due to the mode of management which favours re-establishment of the original biodiversity. The plantation process, associating damar with other useful tree species, basically recreates the skeleton of a forest system. Then, common mechanisms of natural vegetation dynamics⁶ are given the major role in the evolution and shaping of the cultivated ecosystem. As in any secondary

3. Facing an increasing flow of external, unauthorized tappers, traditional communal control appeared not to be strong enough to defend legitimate access to damar trees for the eligible tappers of the community. The fear of seeing "strangers" appropriating the fruit of their labour led the authorized tappers to over-tap their trees.

4. It can be considered as a refined form of the so-called "taungya system" for forest plantation establishment integrating several successional stages and using natural vegetation dynamics instead of a mere association between tree seedlings and annual food crops.

5. A high botanical richness, a multi-layered vertical structure, as well as specific patterns of forest dynamics.

6. Pollination, fructification and production, seed dispersion and germination, seedling and sapling development, chablis and gap colonization, water and nutrient cycling.

vegetation dominated by trees, the maturing damar plantation provides a suitable environment and convenient niches for the establishment of forest plants carried from the neighbouring forest through natural dispersion. It also offers shelter and feed to forest animals. In this natural enrichment and diversification process, man merely selects among the possible options given by ecological processes, thus favouring resources, but non-resources are establishing and reproducing as well⁷.

A Diversified Forest Resource

Biodiversity allows a diversity of economic uses. While re-establishing a particular forest resource of economic importance, Pesisir farmers have managed to restore a whole range of economic products and functions originally offered by the forest like hunting, fishing and commercial collection. They represent important complementary subsistence resources for households⁸. Damar gardens ultimately represent a source of potentially marketable commodities: timber, rattan, medicinal and insecticide plants.

But damar gardens should not be analysed merely from the point of view of forest management. They should not be dissociated from the agricultural context in which they were conceived and in which they are presently managed. Damar gardens have been definitely established not as a forest but as an agricultural unit, in a perspective of commercial production. They

are part of lands that are agriculturally claimed by local people; they are managed mainly as agricultural enterprises.

Commercial management of the gardens' timber is also developing. In addition, gardens can be managed as safety assets: a garden, or a part of it consisting of several selected trees can be "pawned" through special agreements called *gada*⁹. As any other agricultural unit, gardens can also be engaged through tenant farming or sharecropping agreement.

Through the social compensation systems associated to the individual property of gardens inside the lineages, the gardens constitute the base of a family assistance network.

Agro-forests

The damar agro-forests offer new insights into the definition of technical, ecological as well as socio-economic and institutional bases for managing forest resources into agricultural systems. They open new perspectives for re-inventing forest common property resources through an original agricultural perspective.

Perception, Representation and Control: Private Gardens versus Communal Forest?

Appropriation of the ancient forest resource in the existing agricultural context has entailed an important reorganisation of traditional representation and control systems for natural resources.

7. It should be noted that these "non-resources" plants are not considered as "weeds" by the farmers, and that some of them can be turned into "resources" if needed.

8. These include various fruits, vegetables and spices, firewood as well as other plant material, and medicinal plants.

9. "Pawnbrokers" (any villager with funds available can become a pawnbroker) may provide loans of several thousand rupiah for one garden for an undetermined period (at least one year). Tree production serves as yearly interest for the creditor, who for the whole period of pawning can use the garden for his own convenience, except for selling or transforming it. The agreement ends as soon as the garden's owner refunds all the money to the creditor or when he claims the profits made by the creditor are sufficient.

10. Among the explanations put forward for such a mutation, the religious evolution towards an "adult" Islam comes in a good place. Islam has shown the errors of former beliefs in which spirits and magic held a determining role. This feeling of returning to the straight and narrow way is totally in line with the first principle of the political ideology of Indonesia, known by all Indonesian citizens from the very beginning of the elementary school, and which gives full support to the great religions in their holy wars against animism.

1. A garden, not a forest

The ancient perception and representation systems of natural forests and forest resources are presently quite obliterated, at least in villages which have reached the limits of their territorial expansion. While disappearing from the immediate environment of villages, the forest has lost its importance in the farmers' imagination¹⁰. Reference to the ancient myths or to forest spirits and magic is presently very rare. The forest of the past, source of material wealth as well as spiritual blessing, represented an imaginary world as well a major source of life. The forest of today is neither mythical nor mystical; it is no more than the domain of forest administrators.....and secondarily that of troubles for whom who dares to enter it too conspicuously.

The Damar forest remains categorised as an agricultural unit, as it results from a plantation process. It is commonly called *darak*, equivalent to the Indonesian *ladang*, a generic term which designates any field opened in the forest, or *repong*, which formerly designated privately owned fruit gardens surrounding villages. Pesisir farmers also often describe it with the Indonesian word *kebun*, which means "garden", "plantation". However, if the dominant species, damar, which gives its name to the garden (*kebun damar* or "damar garden") is actually considered as a crop, the difference farmers make between cultivated and managed or even wild plants remains somewhat vague and highly subjective.

The agroforest itself will never be assimilated to a forest (*pulan*), except in the context of very specific activities.

2. Private property, redefined

At the beginning of the century, the introduction of perennials in the *ladang* was formally accepted and, as villagers started to plant trees in their swiddens, private appropriation of land was legally acknowledged by the customary law system¹¹.

This privatized system of tenure has not entailed promotion of individual control nor fragmentation of the agroforestry domain. The customary law

system makes a clear distinction between *hak milik penuh* ("full property rights") which designates a newly created land for which the owner is the absolute master, and *hak waris* ("inherited right") which concerns inherited properties.

"*Hak waris bukan hak milik saya*", "heritage is not my property": this ethic of the customary law system constitutes a clear safeguard against total individualization and privatization while ensuring the parenity and integrity of the agroforest structures for future generations. The Pesisir land tenure system should not be considered as a common property regime, but it cannot be dissociated from a social system in which the lineage community holds a major role.

3. Wild resources and common property in the agroforest

Private appropriation is obvious for damar trees and the land under them; but in reality, it does not cover the integrity of the agroforest domain. Many resources are still considered as common property. This definition of differential access rights to individual resources inside a privatized domain has to be put in parallel with the distinction people make between "planted" and "spontaneous" resources.

These "planted" resources are privately owned, but often, except for damar, are commonly used inside the lineage, and give rise to exchanges, donations and gifts between distant members of the lineage. A *contrario*, "spontaneous" resources represent those totally wild species, carried from the neighbouring forests by winds or animals, which exist accidentally in a garden, which may or may not be protected and utilized, but that nobody ever cared to plant. These "spontaneous" plants, like wild fruits and vegetables and medicinal plants, constitute a pool of common property resources for the whole village community : any villager is allowed to collect them without prior notice to the owner of the land on which it occurs. Rattan, together with water resources and terrestrial fauna, which constitute resources that are still collected undifferently in the forest or

¹¹ However, land property could only be claimed through tree plantation, and the old tenure system prevailed for fallow and forest lands.

in the agroforest, are under a more open access status.

The Agroforest Strategy Revisited : Lessons of a Transfer

The resource management strategy developed by Pesisir farmers through the damar agroforest is obviously original. What can this "agroforestry strategy" offer to the debate about natural resource management by local communities?

1. A new type of forest management, a new type of agricultural plantation model

As far as natural forest management is concerned, establishment of the damar agroforest represents an interesting example of forest product development for commercial purposes. If this development strategy did not protect the forest as a whole—it entailed a total transformation of the original ecosystem, it was even part of the process of forest conversion—it however succeeded in preserving most of its resources and retained biodiversity.

As a forest plantation strategy, the agroforest model of the Pesisir runs counter to conventional timber, pulp or rattan estates which are presently developed. While favouring a selected resource, as estates do, the agroforest allows the maintenance of numerous other resources that otherwise would not have been conserved purposefully, and species that are not direct resources are restored as well.

2. From extractivism to agroforest : Some important consequences

The main objective of the agroforestry development strategy of Pesisir farmers was obviously to develop a sustainable commercial enterprise able to overcome the weaknesses of the ancient extractivist system. Indeed, it allowed not only to halt the process of resource exhaustion from the natural environment, but also to solve social problems linked to the failure of former common property regimes devised for the control of that resource and to introduce a new balance in local management systems for natural resources. The technical and

institutional framework developed through the agroforest had several important meanings and consequences. Agroforestry helped individuals in developing a patrimony : land property and productive structures established not for the grower himself but for the forthcoming generations. This notion of agroforest patrimony introduced the concern of long-term maintenance and transmission, which the agricultural institutional framework created for ricefields was more likely to assume than former extractivism structures.

3. The agroforest context for the management of forest resources : The lesson of renewability

The agroforest technical, ecological, social and institutional context devised by Pesisir farmers appeared efficient for the sustainable management of forest resources. The reproducibility of the agroforest as a whole over the past century clearly shows that farmers have devised, technically through the mimicry of natural forest structures as well as institutionally through privatization under communal supervision, a sustainable way to manage it as a renewable resource. And this is an essential lesson for all those who attempt to devise sound strategies for managing the forest resources as renewable ones.

Conclusion

A new framework for the reappropriation of forest resources by local communities

In the present institutional and socio-economic context in Indonesia, which appears quite unfavourable to long-term maintenance of the forest itself, the whole process of damar agroforest establishment and development appears as an extremely original strategy of re-appropriation of the traditional "forest resource" of peasant economies on forest margins. In the Pesisir, farmers apparently gave up, after years of conflicts with the Forest Services, most of their claims over the natural forest which is henceforth considered more as a geographical unit of an administrative landscape than as an ecosystem or as a resource,

in fact as the exclusive, reserved and closed domain of the State. Agroforests on the contrary represent a man-made structure where the forest resources are appropriated and managed in accordance with the farmers' needs, philosophy and beliefs. If the first agroforests were established as a response to resource exhaustion, the present agroforests are also established against the forest, as a claim over the closure of forest lands and resources for local communities : through the agroforest, farmers claim that they have purposefully restored, in the middle of an agricultural territory upon which they believe to hold a firmer control, a privileged space in which their forest resource is protected. And, in that sense, the fact that farmers do not assimilate their agroforest to a "forest" is essential to take into consideration.

Agroforests are NOT a natural fact that can be managed or gradually modified. They represent a man-made area, vocation of which has been imposed by farmers communities. They result from a voluntary decision of these communities to re-establish forest resources and to recreate forest structures. Natural forest management in Indonesia, including extractivism, is still a form of exploitation of a Nature's gift. Agroforest management is already beyond that : it is the

invention and the achievement of a new form of resources management on former forest lands.

The future of the damar agroforest is threatened, not for biological reasons but for pure socio-economic considerations, among which is the emergence of new priorities in farmers' wishes and needs. But the main threat lies in institutional incoherences between national and local right and perception systems concerning forest resources. Government bodies do not acknowledge damar agroforests as a true land-use system; they do not conceive them as a valuable strategy for Pesisir development; they do not fully recognize the claims and rights of Pesisir farmers over the lands and resources they have developed through the agroforest. Most of the agroforest is still considered as "natural forest" on "government forest lands" and can be subjected to any development project from the department of forestry, which is more likely to promote industrial forest plantation for pulp than to support any form of community management. As long as this confusion between forest and agroforest is maintained, as long as local practices for management of forest resources in farming systems are ignored, the chances of survival of the agroforest as a unique model of integral forest management will not cease to decrease.