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The Netherlands

Can traditional forest management protect and conserve ironwood (ulin) stands? An option and approach in East Kalimantan

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Citation

Wahyuni, T. (2011, November 10). *Can traditional forest management protect and conserve ironwood (ulin) stands? An option and approach in East Kalimantan*. Retrieved from <https://hdl.handle.net/1887/18056>

Version: Not Applicable (or Unknown)

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Note: To cite this publication please use the final published version (if applicable).

Summary

Worldwide concern over deforestation of rainforests due to widespread logging has impressed upon the Indonesian government the importance of conserving and managing these natural resources. The forest resources of East Kalimantan are very rich but are under severe pressure, particularly from commercially destructive cutting techniques. The main threats to tree species are caused by deforestation and overexploitation of trees, forest conversion to agriculture and plantation area, uncontrolled forest fires and unsustainable forest management. Globally, large (and old) timber trees are becoming ever more scarce to the point of being endangered – particularly some of the favoured rainforest species.

Borneo ironwood (*Eusideroxylon zwageri*), more popularly called by the local name *ulin*, is one of the favored rain-forest species and appears to be the most valued individual species from a local perspective. On the one hand, the species is perceived and considered as a ‘people’s species’ or a ‘species reserved’ for local use in the village subsistence systems. On the other side, however, this tree species is threatened by overharvesting for commercial trade. The majority of ironwood entering into international trade is from unmanaged natural forest.

In East Kalimantan it is vital to understand the land use systems of the indigenous communities or groups. Their populations are sustained through a mosaic of land use practices. The mosaic of land management systems creates diversity in the landscape, as well as the opportunity to benefit from the assorted diet and income generation activities facilitated by these systems. But they are facing pressure on its cultural dynamics due to Indonesia’s rapid development and the decentralisation of the forestry sector. This is the case, even though indigenous people have lived in the forest and have practiced forest management for generations. People actively manage and exploit the forest surrounding them by selectively conserving valuable tree species. Traditional forest management systems for a certain tree species, however, are not recognised. This study provides

important insights into and addresses recent issues and formulates recommendations for a set of integrated policies in relation to the exploitation of forest timber, to support the sustainable management of ironwood and its cultural role in the life of local people in the research areas.

This thesis tries to answer the following questions:

1. What is the natural distribution of ironwood, the tree diversity in association with the variability of ironwood and the role of ironwood in forest ecosystems at the research sites; and what is the impact of the traditional management systems on natural ironwood stands?
2. What are the traditional land use system and their role in the management of ironwood trees and utilisation strategies of ironwood; and what are the external influences on the traditional management of ironwood?
3. What traditional knowledge of cultivation do indigenous people have and what are their conservation efforts in relation to ironwood?
4. What can we learn about the chain of production to consumption of ironwood from East Kalimantan from the current conditions?
5. What conditions can contribute to the success of an integrated collaborative conservation programme, with the aim of developing a strategy for the sustainable management and conservation of ironwood?
6. What can we contribute to develop the possible intervention by synthesis and recommendations?

Natural distribution of ironwood stands and tree species diversity

Understanding of the natural distribution of ironwood and the natural genetic tree species diversity is important for helping local people evaluate the present and potential future value of their forests resources. The research took place in customary forests in two villages of the Paser District, namely: Muluy and Rantau Layung in East Kalimantan. A supplementary inventory of natural ironwood for this study was also conducted in these villages. Data about tree diversity in association with the variability of ironwood at the research sites was collected using systematic plot sampling.

The forest vegetation at the research sites had tree species richness. There are many differences in species and family richness, the distribution pattern of ironwood trees, parameters in inventory (mean density, basal area and potency) between plots in Muluy and Rantau Layung. Ironwood density in plots of belonging to the Muluy is higher than plots in Rantau Layung. This may indicate that community forest reserves in Muluy

remain heavily forested and have not been disturbed by commercial logging. The people of Muluy and Rantau Layung also recognise three varieties of ironwood. Ironwood natural stands are a scattered component of the Dipterocarp forest. At the research sites, ironwood grows in small clusters. Ironwood stands are not spread evenly, but stand in groups; sometimes only a few trees can be found in one hectare.

Customary laws regarding the extraction of trees from these areas remain strict and are still heavily enforced. Removing trees remains restricted to personal use. Community forest reserves also provide a number of forest products and non-timber forest products. From the study, it was found that the local communities conserve forest tree species traditionally for livelihood, religious and cultural practices and for the benefits they derive from the forest as in the case of medicine and for the apiculture. The ethical access to extract ironwood and the existence of ironwood density in their forests are evidences that ironwood resource is not over-harvested. Ironwood trees are still respected by the community because of their traditional associations with other trees and plants.

The important thing that this study reveals is that the local communities are well aware of the important benefits they derive from the forest and, in particular, those people who live within the forest have more affinity to the forest because their life is associated with the existence of the forest. The management of customary forest by indigenous peoples presents evidence that, within this traditional management, specific attention is paid to the sustainability of highly valuable trees, particularly ironwood. Their lives depend largely on the forests, which they have taken care of for generations. These practices should enforce by traditional administrative setups in the community, but presently modern administrative activities eroded their ultimate authority.

Management and sustainable utilization strategies for ironwood

The research investigated the complex of activities that includes agriculture and forest management among swidden agriculturists in the research villages, for the purpose of understanding how these different sets of activities are related to each other. It also studied the traditional land use system and its role in management of ironwood trees. The identification of land uses, as well as the traditional or local names of land uses types was conducted and recorded based on the information from the field assistants such as the *adat* chief, a member of a local non-governmental organisation (NGO) PEMA (*Persatuan Masyarakat Adat*) Paser, and villagers as collectors who were appointed based on their experience and their knowledge in terms of the local names of plants.

Muluy and Rantau Layung people are part of the Paser indigenous people, who have lived in close harmony with the forest. Their village territories are commonly divided into several designated areas. Various forms of land use types can be distinguished, which serve various needs as well as fulfilling conservation functions. These people also maintain several land use practices, they uphold traditional laws pertaining to land

tenure and they have immersed themselves in the market economy by collecting many forest products. Although the main activity for people in both villages of the study areas are their shifting cultivation plots, other activities remain important. Throughout the creation of this culture, these people have developed a sound system of land management and customary laws, which allows them to benefit from forest resources through the extraction and management of fallow fields.

Forest islands, or *simpukng*, are created to protect tree stands or tree reserves, where people find trees in clusters. *Simpukng* comprise mixed tree species and play a role in the production, protection and culture function of the Paser indigenous people. *Simpukng* are mostly protected and consist of both cultivated and wild floras, which provide environmental and economic benefit. The *simpukng* also functions as an in situ conservation area for ironwood and other plants. Ironwood stands also occurred, associated and distributed in *alas tuo* (old-growth forests). From a land use system perspective, the *simpukng* and *alas tuo* systems offer an interesting challenge for ironwood conservation. These are genuine examples of '*kebun lindung*' or 'protected forest gardens', which provide not only valuable tree species like ironwood, but also fulfill both environmental and economic functions.

The Paser indigenous people employ traditional ways of cultivating land and cutting trees, including ironwood trees, in order to limit the risk of over-exploitation. Ironwood has long been an important product of the old-growth forest. Traditionally, the valued stock was used sparingly by villagers for local construction and traditional uses of tools. Ironwood in particular, with its myriad of non-substitutable subsistence uses, was rarely harvested for commercial purposes, although ironwood shingles could be sold for cash to buy food. Ironwood tools are important in all aspects of cultural life. People make timbers and utensils from the remnants of the trunk of a felled ironwood tree, rather than from the fresh, new and complete tree.

A human rights' issue may be involved in this case. It has been mentioned that Muluy and Rantau Layung people depend on ironwood for many traditional uses and the public infrastructure of their villages. However, traditional knowledge from its uses mainly consists of the knowledge to maintain the sustainability of the timbers. Ironwood is a forest product that is managed according to local rules of access. The trend of increasing market opportunities is a threat to ironwood's continued existence. In the face of weak national laws regulating forest use, numerous communities have reinforced their own *adat* (customary) laws to prevent extensive forest destruction.

Cultivation and conservation efforts in relation to ironwood

The research describes the information related to traditional knowledge of the cultivation and conservation efforts related to ironwood by indigenous people. The research also includes information about the landscape and land use patterns related

to ironwood conservation, as well as ecological knowledge. It also deals with factors in the socioeconomic context that affects stocks of ironwood and it identifies constraints and analyses the external influences on these cultivation and conservation efforts for ironwood. The Dayak Agabag people consider shifting cultivation to be a very old method, one which has been used for hundreds of years. The Dayak Agabag people maintain several different types of land use practices; they uphold traditional laws pertaining to land tenure. There are four main farming systems at the research sites: rain-fed paddy, smallholder plantation (oil palm and monoculture pepper), *jakaw* (fallow rotation systems with upland rice as crop) and agroforestry systems. This study shows a number of both native and exotic tree species occur in the traditional agroforestry *ladangs* of Dayak Agabag people.

As many farmers are demonstrating, ironwood can be propagated by transplanting wild seedlings. Many farmers are interested in ironwood planting but, while they have indigenous knowledge, they often lack modern technical skills and tools. In two villages visited at the research sites, there was at least one person considered to be an expert on local trees and ironwood trees had been planted without the assistance of the Forestry Department. The conservation forest can be improved by providing opportunities for small-scale farmers to cultivate useful forest products outside of protected areas. Trees planted on-farm can be an important genetic resource if attention is paid to the origin and genetic variation of the cultivated material. As natural forests diminish, as a result of agricultural expansion, the management of farmland also for the conservation of biodiversity becomes increasingly important. Research indicates that, in some areas, the number of trees planted on small-holder farms has increased together with human population density. Natural forest has been cleared, however, more trees have been planted on-farm to compensate for this loss.

Agroforestry may be a particularly appropriate method for conservation in the highland areas of East Kalimantan, where population density and the pressure on natural forests are especially high. From a land use system perspective, the *jakaw* systems (old *ladang*) offer an interesting challenge to ironwood conservation. In areas of exploitation, this system of 'conservation through cultivation' is likely to be more effective than attempting to sustainably manage ironwood within natural forest. A land-use strategy based on agroforestry entails an effort to restock critical land with forest and simultaneously develop food and minor forest products in a way that is ecologically and economically more appropriate than single-species forest plantations. Moreover, there will be much greater participation by local people in these efforts.

The chain of production to consumption

The information about the production to consumption chain of ironwood is designed to fill existing information gaps with regard to ironwood logging, production, distribution and consumption. The research also describes ironwood business and trade as part of a side-effect of illegal cutting in East Kalimantan province and examines what we can learn about current ironwood markets by analysing available ironwood trade documentation. It also looks at whether the current Forest Law Enforcement (FLE) policies are appropriate for curbing illegal trading and cutting of ironwood.

The global demand for ironwood products is met with timber that originates from the old-growth forests of Kalimantan through the clear-cutting of conversion forest and mixed with illegal cutting from different status forests. New uses for ironwood have been found within the changing context of modernisation in Asia. In addition, increased demand is also related to the fact that transportation of ironwood products has become easier, which has added value to the wood. Although initially ironwood supplied the primary market for local construction material, modern processed ironwood products are also competing for ironwood raw material. The various and broad range of uses of ironwood have stimulated a high demand, thus increasing the volume of trade. This imbalance is particularly true in the vicinities of cities and around other areas of concentrated demand for wood. Within the last decade, the demand for ironwood by local and international trade has exerted enormous strain on lowland forests in Kalimantan. In fact, over one fifth of total acreage depletion in East Kalimantan is being used explicitly for the production of ironwood processed modern products. Ironwood is traded worldwide in significant volumes. At least 95 per cent of ironwood processed modern products are sold to Japan and China, followed by Korea, Taiwan and Germany. These products originate from timber removed from the lowland forests of Kalimantan, from areas where the trees are very slow growing.

There are also cases in which extraction results in overexploitation, especially when ironwood products are commercialized at a great scale. However, ironwood processed products for export represents the most serious trade related issue in the region. Consequently, all of this internationally traded ironwood is a product of a rapidly diminishing area of Kalimantan natural rainforest. As a direct result of this commercial activity, ironwood has become the focus of increasing conservation concern.

Conditions for the success of an integrated collaborative conservation programme

Conservation initiatives taking into account the social and cultural values of the ecosystem may particularly benefit from identifying and focusing on cultural keystone species. The detailed traditional ecological knowledge of ironwood and other plants

can bring ecologists and conservation biologists a better appreciation of and respect for traditional knowledge systems, and can serve as a window through which such understandings are realised.

Modern forest conservation approaches poorly understand the holistic world views and forest related ways of life of the local communities. Many forestry and conservation laws fail to recognise indigenous and nomadic peoples' rights over the territories that they have historically occupied, and to take into account their traditional farming, hunting, fishing, grazing and gathering practices. This makes it more difficult for many local people to maintain their traditional diets, health practices and ways of life. The policymakers must recognise the reality of local conditions where the people make their living by utilising the forest, and they must adopt forest management methods that reflecting these conditions.

Most importantly, local people's rights to unplanted forest products such as ironwood have never been recognised because villagers' rights and roles in terms of their management are neither sufficiently understood nor acknowledged. For example, although a community or a household may have decided to extract less intensively from a forest area in order to conserve and encourage certain products to grow, the management aspects of this decision are disregarded by forestry professionals. No timber company pays compensation for trees thus conserved. Traditional *adat* management was not adapted to the constraints and opportunities of the modern economic system. It will greatly support the conservation of rapidly diminishing forests of the region, if these traditional practices are integrated with modern conservation efforts. However, it could be adapted to modern conditions if the forestry department would recognise the existence of a community system for controlling access to ironwood within locally defined territories, and if the department would support this system in procedures of conflict management.

Conclusions

Forest products will probably not solve development problems, but having access to a multitude of these products make community forest programmes (and forest protection programmes) more economically and socially acceptable to local communities without whose support many such programmes often fail. In addition, traditional forest management, and traditional agroforestry are especially palatable to local cultures many of which have been practiced for centuries.

Local communities are an important determinant in the success of conservation efforts, as they are often involved in cutting ironwood trees and they can derive long-term benefits from sustainable utilisation strategies. Community management of forests can help to overcome difficulties in enforcement of regulations. However, since approaches to forest resource use differ widely among communities, even within a region, the

involvement of communities in conservation efforts has to be location-specific rather than prescriptive. This makes the development of management plans a lengthy process and, often, longer than the time window available for effective conservation action.

Indigenous knowledge and involvement is crucial to the development of conservation and sustainable forestry related ironwood context. The main issues that need to be addressed are the needs of the local people as far as resources and incentives are concerned. It is in the best interest of local people to conserve their natural resources, particularly ironwood resources for future generations. The benefit for local people would be three-fold if they are involved in the conservation and management issues of ironwood. They could then be assured of future resources, possible employment in conservation activities and the land would be protected from outside encroachment. In terms of developing sustainable harvest and management methods and conserving biodiversity, local communities and their traditional knowledge deserve better. With the future needs of natural resources and land in constant competition with timber concessions and other constraints it is vital for indigenous people and conservation groups to work together to protect the future of the forests and the people who depend on them.