

DETERMINING THE INDIGENOUS SPECIES IN THE IMPLEMENTATION OF REHABILITATION STRATEGY

Technical Report No. 4

Herujono Hadisuparto
Suhartadi
Supriyanto

ABSTRACT

This Technical report is made available to satisfy the specific objective 2, output 2.1. activity 2.1.2 on determining the indigenous species in the implementation of rehabilitation strategy. Survey and quantification of the potential indigenous species as planting materials have been done. Whereas indigenous species being used for the rehabilitation of secondary and degraded forests have been determined. Due to lack of good seedling or planting materials in the degraded forest lands, nurseries of forest concessionaire areas were visited. The forest concessionaire can still provide enough endemic species for the future plantation project

The villagers principally accepted the proposed forest rehabilitation project in their ecosystem since it will benefit to them. They agreed the use of endemic species for rehabilitation of degraded and secondary forests, however, they also proposed plantation of rubber and other commercial trees on their community forests or "hutan adat" and even in their cultivated lands. They were confidence that rubber and other short term cash crops were very supportive for economic reason, especially today when the price of rubber has triple in ten years.

All proposed forest rehabilitation projects are located within the major watershed of West Kalimantan province. The six proposed locations from upstream to downstream areas were respectively discussed in the main text. Species mentioned by the villagers for all proposed forest rehabilitation projects can be summarized as follow : ekeranji and rubber; kemiri and gaharu

INTRODUCTION

To asses demands for the rehabilitation of tropical forest resources, it was considered past and present potential use of natural forest with primarily indigenous species, its maintenance and protection, and how much in terms of resources that communities are willing to commit for these activities. Data and information on how local communities perceive of the advantage and disadvantage of the degradation and rehabilitation of tropical forests were criticized on their desired options. Perception of communities and other stakeholders (local assembly / unit committee members, district officials, etc) including tree species they want to plant for this rehabilitation project will be considered.

This survey was conducted by a team and destined to assess various factors needed to be considered in writing a proposal for a self-contained forest rehabilitation project implementation. Past and current socio-economic and environmental impacts were addressed. Several locations selected purposively based on primarily watershed approaches, the existing areas of degraded or secondary forest and the willingness of local communities to participate and collaborate in the project.

There were 6 potential sites within 5 (five) regencies selected including Mentajoi (Reg. of Sintang); (2) Merbang (Reg. of Sekadau); (3) Lintang Pelaman (Reg. of Sanggau); (4) Empirang Ujung (Reg. of Sanggau); (5) Manggang (Reg. of Landak) and (6) Bunbun (Regency of Pontianak). These sites were visited during the month of April and May 2006, including for seedling species selection. Seedlings of indigenous species were found sparsely adjacent the degraded forests but abundantly in the location visited adjacent forest concessionaires

OBJECTIVE

The objective of this activity was to observe and analyse of the existing planting materials for the proposed project implementation. The planting materials desired must be in good quality and sufficient number. Therefore to make sure the availability of sufficient and good planting materials, nurseries of forest concessionaires maintaining indigenous species seedlings were visited.

METHODOLOGY

For the analysis and determination of indigenous species as planting materials there were done following collecting information during discussion with local people in all degraded forest sites.

Surveys were conducted by a team and destined to assess various factors need to be considered in the use of indigenous species for rehabilitation degraded and secondary forest. Several criteria determined in this plantation activity, including:

- (1) An approach in selection of degraded forests to be rehabilitated in the province is geographically based on watershed principle.
- (2) Soil properties of rehabilitation sites will be observed to determine the adaptability of seedling to be planted at certain site and probable treatment needed.

- (3) To stimulate the growth of seedling primarily in unfertile degraded forest mycorrhizae treatment will be applied.
- (4) Local population are willing to cooperate in the development and maintenance of the rehabilitation plots will be recruited
- (5) The size of the individual rehabilitation plots are between 50 to 100 hectare or less at each site selected.

The forest rehabilitation project will consist of 6 potential sites selected, from the upstream area, respectively: (1) Mentajoi (Regency of Sintang); (2) Merbang (Reg. of Sekadau); (3) Lintang Pelaman (Reg. of Sanggau); (4) Empirang Ujung (Reg. of Sanggau); (5) Manggang (Reg. of Landak) and (6) Bunbun (Regency of Pontianak).

FINDING

The strategy developed for the implementation of this rehabilitation program will give benefits to local communities both social-economically and ecologically by means of their participation. The local community generally wanted to use indigenous species in the rehabilitation project, namely : tengkawang (*Shorea stenoptera*, *S. pinanga* etc); ulin/belian (*Euxideroxylon zwaery*); meranti (*Shorea sp*); kapur (*Hopea sp*); bengkirai (*Shorea sp*), jelutung (*Dyera costulata*); damar (*Agathis damara*); durian (*Durio zibethinus*), kelampai (*Elateriospermum tapos*), keranji (*Dialium sp.*) gaharu (*Aquilaria malacensis*).

Whereas domestic commercial trees they wanted to plant such as : kemiri (*Aleuritus molluccana*) and rubber (*Hevea braziliensis*). They use these tree products for short term economical benefits.

Methodes of rehabilitation planting in the degraded and secondary forest with enough shades will be applied *enrichment planting* along the strip and gap of the area. Whereas in the cleared and open areas with alang-alang grasses it will be applied *block planting system*. Most of degraded and secondary forests in Manggang village, district of Landak, and in Merbang village, district of Sekadau, the soil are unfertile consisting of podzolic soil type dominated sandy soil on the soil surface. This therefore land preparation has to furnish with special treatment including the application of mycorrhizal infection.

ANALYSIS

Rehabilitation system using indigenous species and other commercial domestic tree species will promote the benefit for local communities social-economically and ecologically. There will not only be the existing forest resource but also products from the domestic trees such as rubber and gaharu for shorter economic values.

In this proposed forest rehabilitation project its implementation on the degraded production forest several approaches are needed, such as : 1) friendship model to community and also private setor, 2) Intensive silvicultural model especially for forest managed commercially, 3) Planting methods applied either strip, block planting or direct planting on seleted site holes. The use of indigenous species in this forest rehabilitation project ecologically and economically will improve alternatives on biodiversity resource and forest resource management options by local community in order to maintain the sustainable tropical rain forest management program.

Before planting soil properties at each rehabilitation site will be observed and the unfertile degraded forest lands will be treated including the application of mycorrhizal infection through seedling roots. Mycorrhizae are symbiotic associations that form between the roots of most plant species and fungi. These symbioses are characterized by bi-directional movement of nutrients where carbon flows to the fungus and inorganic nutrients move to the plant, thereby providing a critical linkage between the plant root and soil. In fertile soils, nutrients taken up by the mycorrhizal fungi can lend to improved plant growth and reproduction. As a result, mycorrhizal plants are often more competitive and better able to tolerate environmental stresses than are non-mycorrhizal plants. Mycorrhizal can spread throughout the soil surrounding the root system and increase the ability to explore soil areas, accessing water and nutrients for plant roots. Benefits to plants are improved water and nutrient uptake, enhanced Phosphor transport, and drought and disease resistance. Study conducted in a regenerating dipterocarp forest of West Kalimantan (Hadisuparto et al., 1988) found that the presence of mycorrhiza in the soil rhizosphere chemically promoted cation exchange capacity and provided more phosphorus due to phosphate enzyme from the fungi, calcium and magnesium, potassium and sodium. It was also suggested that for further development of regeneration growth the vegetative and regenerative seedlings had to be inoculated by ectomycorrhizae.

CONCLUSIONS

The use of indigenous species for rehabilitation of the degraded forest has been agreed by local communities in all project sites selected. The villagers also proposed to plant rubber and other commercial domestic trees in their degraded lands for their short term economic benefits.

Through participatory approach planting methods will be applied in the degraded forest with different types of vegetation covers. The availability of planting materials has indicated sufficient in number and quality, even though most of them can only be provided by forest concessionaire's nurseries.

Parts of the areas within the degraded forest the soil type is dominated by sandy podzol. The unfertile degraded forest lands to be rehabilitated will be treated including the application of mycorrhizal inoculation onto seedling roots. Silvicultural system was determined depending on the degraded forest condition, either enrichment planting or block planting in each targeted site, using indigenous species and several commercially domesticated species.

RECOMMENDATIONS

The rehabilitation project conducted through participatory approach, it will not be a product of a top-down program, therefore it has to evolve farmer's need and deliberate choices of what to plant. The project will also recognize local community participation in all stages of forest and tree resource management.

Indigenous species were selected and will be planted according to the proper site respectively. However, in each of all rehabilitation projects, as the villagers correspondingly proposed, commercial domestic species should also be planted primarily rubber and other cash tree crop species.

Soil treatments must be done before planting of seedling since there have been found poor soil condition in several rehabilitation project sites. Mycorrhizal inoculation will be applied in the plantation activities to overcome the soil problem. In the sandy podsol soil, additional local adaptive tree species will also be planted where pre-condition of the ecosystem must be created.

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