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REHABILITATION OF PROTECTION FOREST THROUGH COMMUNITY FORESTRY-BASED AGROFORESTRY IN SOUTH KALIMANTAN, INDONESIA

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Abstract

Indonesia has a total forest area of 134 million ha, some of which 30.5 million hectares are classified as the protected forest. Most of the protected forests have already been damaged because of illegal logging and forest fires. These areas have eventually become grasslands. According to MFI (2012), the extent of critical land in Indonesia is 22.02 million hectares, with a critical category up to a very risky one. This writing aims to provide lesson learning rehabilitation of protection forest area through Community forestry-based agroforestry. The first step is social reconstruction, and the second step is training and planting activity. The planting of rubber began with a distance of 3m x 7m area covering around 13 hectares. Meanwhile, 12 hectares were planted with rubber in 2013 and 2014. These areas were planted with about 80% rubber trees and 20% multi-purpose tree species. Also, 50 hectares of bee forage plants were established in 2014. These areas were enriched by planting coconut and sunflower. Results indicate that cooperation, mutual trust, and workgroups are the social factors that are necessary for the plantation establishment. Meanwhile, the establishment of paddy crops, chili, long beans, and squash contributed to the economic aspect. Lastly, birds' presence, prevention of forest fires, and the microclimate's improvement were among the ecological contributions of this initiative.

Keywords: agroforestry, grassland, protection forest, community forestry

Introduction

Indonesia has a total forest area of 134 million ha, of which 30.5 million hectares are classified as protected forest. Most of the protected forests have already been damaged because of illegal logging and forest fires. These areas have eventually become grasslands. According to MFI (2012), the extent of critical land in Indonesia is 22.02 million hectares, with a critical category up to very risky.

A community-based forest rehabilitation approach can be taken to improve the area. Forest rehabilitation is a comprehensive effort to improve the forest environment's quality by considering the ecological and social aspects of the community's economy (Stanturf, 2005).

In the past, most rehabilitation programs were controlled by the government, dependent on funding from the Indonesian government and international donors and generally focused on technical aspects. Institutional arrangements for implementing rehabilitation programs effectively in the field have not yet been developed. As a result, local communities have not

adopted rehabilitation techniques, both those living in and around the target area. An innovative approach is needed to achieve the rehabilitation program's goals while also providing economic and social benefits to the company and the community (Nawir et al., 2007).

Forest rehabilitation activities must be planned in the long term. Government policies and the involvement of various parties are needed to support the success of forest rehabilitation (Liu et al., 2003). The key to success in forest rehabilitation is to create sustainable benefits for local communities. This is why rehabilitation projects must be planned to improve the lives of local people in the long term. In other words, the key to successful forest rehabilitation is securing land use rights of local communities to harvest trees planted with wood products or the right to collect non-timber forest products.

In recent decades, the Ministry of Environment and Forestry has implemented some rehabilitation projects in degraded Protection Forests for environmental purposes and not for harvesting wood. In the case of an environmental rehabilitation project, it is difficult for local communities to benefit from the project because there are no timber forest products utilized by local communities. Therefore, forest fires often occur, and there is no community participation in maintaining rehabilitation projects. This also happened in Protection Forest in Tanah Laut Regency.

The program of local community-based forest rehabilitation was developed through the concept of community forestry. One of the schemas, one of the schemas is the Community Forest. The Community Forest Program involves the community to play a role in the management of state forests. Of course, this community forest program provides great benefits for the community. The implementation of the Rakat Forest program is intended to develop capacity and provide access to local communities in managing forests in a sustainable manner. This is intended to ensure the availability of employment for local people to solve economic and social problems. Community Forest aims to improve the welfare of the local community through the utilization of forest resources in an optimal, fair, and sustainable manner while maintaining the preservation of the forest and the environment's functions.

The active involvement of local communities in the management of protected forests has important significance. This is reflected in the Minister of Environment and Forestry Regulation No. 83 of 2016 concerning community forestry. The Government of Indonesia of the Republic of Indonesia through the Ministry of Environment and Forestry has issued a community forestry policy or program. Community Forestry is intended to plant, protect forests, and improve the local community's standard of living. One of the implementations of the above policy is the rehabilitation program of the international cooperation W-BRIDGE of Waseda University, JIFPRO, and Lambung Mangkurat University. Through this collaboration, the Community Forest Program with an agroforestry scheme, rehabilitation will be carried out in degraded Protection Forest based on local community participation covering 58 hectares.

Method

The W-Bridge project was carried out in ³ Tebing Siring Village, Bajuin District, Tanah Laut Regency, South Kalimantan. The object of observation is physical activity. Physical activities include planting and maintaining the land. The area of forest that has been managed is 58 hectares, with 80% rubber species and 20% Multi-purpose Tree Species (MPTs). The basic method is the descriptive method, to obtain facts from the existing symptoms and find out factual information about the institution's role and mechanism, group dynamics, and physical activity processes in the field. Data collection techniques refer to Creswell (1994), are including in-depth interviews, Focus Group Discussions (FGD), and participatory observation. The research subjects were members of active farmer groups involved 25 people, including group administrators. Key informants included the Village Head, Forestry Extension Officer, and Head of the Forest Service of Tanah Laut Regency.

Data analysis was based on an interaction model consisting of three activities that occurred simultaneously after the data collection period (Miles and Huberman, 1992), namely: reducing data, e.g., sharpening, classifying, removing unnecessary and organizing ¹ data in such a way so that the conclusions can be drawn and verified: Presentation of data in the form of a compiled set of information provided the possibility of drawing conclusions and taking action. Conclusions are drawn loosely but openly and formulated in detail and firmly rooted.

Results and Discussion

Social Reconstruction and Role Sharing

Management and utilization of forest resources in Indonesia have been carried out on "timber management-oriented and pure economic oriented. Such management has failed, triggering the destruction of natural resources and ignoring the interests and participation of rural communities around the forest (Awang, 2004). According to Hubeis (2004), forest management activities that are more oriented to economic growth have caused people to be marginalized from the surrounding forests. In this relation, the physical exercises in forest management, e.g., planting and maintaining plants, require community participation. The W-Bridge Project begins with social engineering. This includes : (1) the involvement of community leaders, e.g., Head Village and Chairs of Farmer Groups, (2) the limited discussion about the reasons for working together in these activities, (3) making an understanding and agreement on the pattern of partnership collaboration that will be built in activities with the leaders, and finally (4) socializing to the members of the farmer groups about planned activities that will be carried out together.

This social engineering is in line with the idea that the utilization and management of forest resources is basically not merely a technical issue of forestry (land, water, trees, wood production, and non-timber forest products), but rather a "social" problem that stems from fulfillment basic needs and improvement of the welfare of rural communities. Therefore forest management must involve the participation of rural communities by providing opportunities to participate in utilizing and managing ⁴ forests according to their understanding, knowledge, technology, experience, and traditions (Aryadi, 2012; Nurjaya, 2005; Masserschmidt, 1992; Burch 1992; Peluso et al.).

Social reconstruction activities are carried out comprehensively and continuously. Socialization and discussion with farmer group members are carried out at least 3 (three) meetings to produce an agreement to form cooperation with the parties. Agreements between farmer groups and facilitators (Team of the Faculty of Forestry, Lambung Mangkurat University) include (1) half wage system, (2) types of plants, (3) spacing, (4) system of determining the location of land per member, and (5) statement of farmer group members. The agreement was attended by (1) management, (2) group members, (3) village officials, and (4) forestry instructors. While the Team of the Faculty of Forestry, Lambung Mangkurat University was present to facilitate and provide suggestions or recommendations if needed. The social engineering carried out by the Team of the Faculty of Forestry, Lambung Mangkurat University, in preparation for the W-Bridge Project for 6 (six) months before the physical activities were agreed to be implemented.

The half-wage system is regulated that each farmer group member-only gets half of the current wage. For example, the daily work wage is Rp. 70,000 / person, he must be willing to be paid Rp. 35,000 / person. The stakeholder role sharing activities have been carried out since the activity plan was prepared. The W-Bridge Project involves stakeholders, namely:(1) The team of the Faculty of Forestry of Lambung Mangkurat University, as a facilitator, mediator, research, and connective party communication; (2) WASEDA University, which acts as a researcher; (3) JIFPRO, which acts as a researcher, director, and mediator of the parties from Japan, (3) Bridgestone Japan / PT. Bridgestone Kalimantan Plantation (BSKP), acting as for providing seeds, fertilizer, and technical training; (5) Tanah Laut Regional Government (Tanah Laut Forestry Service), whose role is to encourage local policies, allocate APBD / APBN, counseling; and (6) Tebing Siring Village Government, whose purpose is to promote local politics and policies, and to form the Farmers Group " Kelompok Tani Ingin Maju." The six related parties or Win 6 agreed to participate equally to succeed in this program.

According to Fauzi (2010), the form of partnership by placing the community as the main actor in and around the forest means that at the same time, the partnership functions the Village Government and Farmer Groups in forest management. This is a clear manifestation of decentralized forest management. In this connection, the values of cooperation and solidarity will develop informally following government-formed institutions. The support and cooperation of related institutions that can create a program's success is a factor driving the success of an activity that involves the community (Aryadi, 2012). The government plays an important role in determining the area's management as a place of livelihood for the community (Manivong and Cramb, 2008).

The Team of the Faculty of Forestry, Lambung Mangkurat University, with W-Bridge Project funds, places one active student of the Faculty of Forestry as a companion who attends at least 1 (one) time a week. Routine meetings are held at the beginning of each month. The meeting was attended by a team of Lambung Mangkurat University facilitators and farmer group members and management. The purpose of the meeting was to evaluate the activities' results and plan activities for the following month. Regular monthly meetings are often attended by relevant parties, such as the Team of Waseda University, the Team of JIFPRO, the Team of PT. BSKP

and Forest Service Officers of Tanah Laut Regency. Assistance and regular monthly meetings with farmer groups run-up to the present time.

Types of Plants Selection

The rehabilitation of the Forest of Mount Langkaras Protection is carried out by considering the community's social aspects. In the beginning, most members of the Community Forest Farmer Group (HKm) "Ingin Maju" worked as community gold miners. A small number of them work as laborers in rubber companies. Work skills gained from rubber plantations are an experienced capital in forest rehabilitation. Guiding a group becomes easier if the commodity is developed under the habits of the community/members (Gilmour, 2000). Members who are familiar with rubber cultivation can transfer their knowledge to other inexperienced members. This condition is a driving factor in choosing rubber as the dominant plant type.

Agroforestry was developed by combining rubber as a staple crop with other types of plants to enrich the diversity of species within the HKm Area. Examples of supporting plants are plants with many benefits (multi-purpose trees / MPTS) such as durian, durian, mangosteen, breadfruit, *petai*, mango, aloes, and *cempedak*. The percentage of rubber plants is 80% of the total number of plants. These species were planted in stages from 2012 to 2015, with a total area of 40 hectares.

The development of agroforestry was also carried out with bee feed based in 2014. Types of bee feed plants planted in the form of Kaliandra, coffee, rambutan, mahogany, and kapok. The selection of these types of plants has been adjusted to the calendar of flowering and the availability of pollen (P) and nectar (N) for each kind of plant. This development is the initiation of the Team of ULM and the Tanah Laut Regional Government, and the Tanah Laut District Forestry Service. The addition of 50 ha of plantations as bee food has provided hope of increasing income for members of farmer groups and the community of Tebing Siring Village in developing beekeeping on their Community Forest land. This is in accordance with the objectives of the Community Forestry program to increase the carrying capacity of the land, increase land productivity and people's income, and conservation of natural resources (forest, land, and water) and all of their functions (Kartasubrata, 2003).

Planting and Maintenance

Based on Regent Decree No. 522/021 / Dishut / 2011 in December 2011 concerning the Proposal of Determining the Area of Community Forest (HKm) and Village Forest (HD), Farmers Group Wants to Progress Tebing Siring Village covering an area of 308 Ha (Aryadi, Fauzi and Satriadi, 2012). The activity has been carried out since 2011/2012, starting with social engineering to the physical actions of plants. The physical action of planting in the field began in 2012/2013. In the first phase of 2012/2013, rubber (80%) and MPTs (20%) were planted in 13 hectares with a spacing of 3 x 7 m. PT provides the procurement of rubber seeds and initial fertilizer. BSKP / Bridgestone, while the W-Bridge Project provides mPTs seeds (Rambutan, Durian, Cempedak, Mangosteen, Petai, Breadfruit). Before the physical activity in the field, 25 farmer members were involved in the training, facilitated by PT. BSKP / Bridgestone. Training materials include the introduction of superior rubber seedlings, techniques for making

runs/planting paths, techniques for making planting holes, transport and planting techniques, and maintenance. The spacing of 3 x 7 m was prepared for the second year of planting paddy fields and chili rice, and the third year of planting coffee. In the outer border, hedges were planted in the type of Gamal (*Gliricidia sepium*) with a spacing of 0.5 m.

Agarwood plants (*Aquilaria* spp) are also planted for some members' boundaries among the farmer groups. Maintenance of rubber plants through "wiwilan", land clearing, and fertilizer application according to instructions given by PT. BSKP. The plants have been planted in the area of 15 hectares with 80% rubber staple species and 20% MPTs, with 3 x 5 m spacing for the second phase of 2013/2014. The combination of rubber plants with other types of plants such as fruit plants, woody plants, and seasonal plants can provide additional income for farmers (Wibawa et al., 2006, Penot, 2004 and Ogwuche, et al., 2012)

Agroforestry land maintenance is also carried out with the pattern of planting annual crops under young rubber stands. There are five members of farmer groups who plant field rice between 7 meters of rubber plantations. They also planted chili between 3 m rubber spacing. They also make fish ponds in the second phase of the area. They get training given by Bridgestone / PT. BSKP for 2 (two) days. The first day's training materials include running / path-making techniques, hole-making techniques, planting and maintenance, and simple fire fighting techniques; The second day's training material is the practice of seeding Mukuna (*Mucuna bracteata*) for prevention of land fires. Plant maintenance is carried out on rubber plants of the first and second phases by planting paddy fields and chili (agroforestry systems), cleaning the aisles, and carrying out fertilizers. According to Smith (2010) has a positive impact on ecological aspects.



Picture 1. Corn and long bean plants between the rubber trees

Conclusions and Recommendations

The development of agroforestry on Community Forest land (HKm) is an appropriate strategy. One-season plants can provide income for members when rubber trees are still young. The cost savings of maintaining rubber plants can also be done with the one-season plants. The results of the research indicate that cooperation, mutual trust, and workgroups are the social factors needed for the plantation establishment. Meanwhile, the establishment of paddy crops, chili, long beans, and squash contributed to the economic aspect. Lastly, the presence of birds, prevention of forest fires, and the improvement of the microclimate were among the ecological contributions of this initiative.

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