

Forest and Land Rehabilitation based on Superior Seeds as a Tenurial Conflict Resolution at Register 38 Gunung Balak, Lampung Province.

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Abstract. Tenure conflicts in the forest area are a problem that continues to this day, including in Register 38 of the Gunung Balak, the area for forest and land rehabilitation. Most of the land in the Gunung Balak area has been occupied and converted into community plantations. The study was conducted in Register 38 Gunung Balak using a case study approach. Social and economic data were collected by survey method, and ecological data were collected through field observations in RHL and non-RHL areas. Data are analyzed using qualitative techniques to interpret the data according to the research objectives. The study results indicate that tenure conflicts have occurred in Register 38 Gunung Balak since the 1960s. The use of superior seed is one option that provides a solution. The community's high preference for better seeds is one of the options for conflict resolution. The impact of the agroforestry pattern of RHL activities with superior seeds not only improves the economy but also impacts environmental and social aspects.

Keyword: Forest and Land, Rehabilitation, Superior Seeds, Tenurial Conflict Resolution, Register 38 Gunung Balak

1. Introduction

Indonesia has a forest area of 94.1 million hectares or 50.1 percent of the total land area in Indonesia [1]. Forests are natural resources that play an essential role in economic, social, cultural, and environmental life [2]. However, Indonesia's forests are under pressure every year, resulting in forest destruction, which has a destructive impact on Indonesia and the world [3]. According to deforestation rate data released by the Ministry of Environment and Forestry, deforestation in Indonesia reaches 1.17 million ha per year.

Degradation is one of the biggest environmental and socio-economic problems and affects 1.9 billion hectares of land and 250 million people. The human need for land is unavoidable, especially for agricultural cultivation and livestock. This sector accounts for 95% of the global food supply. On the other hand, the farm sector is also one of the main factors causing land damage and degradation in various places [4]. Various farming practices incompatible with

land conditions combined with overgrazing and deforestation are the main factors driving land degradation by humans [5][6].

Generally, watershed restoration programs are carried out in upstream areas. One of the activities is planting on critical lands, known as Forest and Land Rehabilitation (RHL). RHL aims to restore, maintain and improve forest and land functions to maintain their carrying capacity, productivity, and role in supporting life systems [7]. The principles of implementing RHL activities referring to Government Regulation No. 26 of 2020 are transparency and accountability, clarity of authority, a sustainable budgeting system (multi-years), participatory, community empowerment and institutional capacity, understanding of the tenure system, cost sharing, and the implementation of an incentive system. In essence, RHL aims to restore the carrying capacity of the watershed and improve the community's welfare. The success of RHL is seen in how much land has been reforested in degraded areas and how RHL has actively contributed to increasing people's incomes, changing perceptions, increasing participation and community behavior related to RHL activities.

The implementation of Forest and Land Rehabilitation often encounters obstacles. One of them is the tenurial conflict that occurred during forest and land rehabilitation. Register 38 Gunung Balak is one of the areas where tenure conflicts still occurs. According to the statistical data from Gunung Balak FMU, forest degradation in Register 38 Gunung Balak has reached 90% of the total area of $\pm 22,292$ ha [8]. Tenurial conflict in the area of register 38 Gunung Balak occurred before the 1960s and continues today. The forest area occupied by the community became a community plantation. The RHL activities can potentially reduce the land as a food source for the community. Various innovations, such as the use of superior seeds, need to be applied for sustainable management. This study aimed to examine the forest and land rehabilitation in Register 38 Gunung Balak, using superior seeds for conflict resolution and studying the impact of forest and land rehabilitation on local communities.

2. Methods

2.1 Study Area

The study was conducted from March until June 2022. The study site was located in Register 38 of Gunung Balak, East Lampung, which is the working area of BPDAS Way Seputih Way Sekampung (BPDAS WSS). The reason for site selection is because the location is the area of forest and land rehabilitation and the areas of tenure conflicts.

2.2 Data collection

Data on social and economics were collected by survey method through in-depth interviews with key informants, questionnaires, and semi-structured interviews. Interviews were conducted with household representatives, village heads, village officials, community leaders, and traditional leaders. Ecological data was collected through field observations on RHL and non-RHL areas and soil samples were taken to get soil fertility and biodiversity data.

2.3 Data analysis

The data are analyzed using qualitative analysis techniques to interpret the data by the research objectives derived from interview questionnaires and observations, describing a

phenomenon and cross-checking with the questionnaire results. In this study, data were processed and analyzed using the Yin approach [9] through five phases: (1) compilation, (2) disassembly, (3) reassembly, (4) interpretation, and (5) conclusion. The presentation of the data will use qualitative description using tables; besides that, it will also present brief explanations/narratives of relationships between categories [9].

3. Result and discussion

3.1 The history of Tenurial Conflicts on the Register 38 Gunung Balak

Conflict is when one party feels that another party negatively influences him [10]. Generally, conflicts are caused by interests between one party and another [11][12][13]. Different interests are the beginning of the conflict [14]. Different interests led to a conflict in Register 38, Gunung Balak, where land tenure and land use were the main reasons for the conflict.

The conflict in Register 38 Gunung Balak began in 1963 with the logging of 1,200 hectares of forest by Barisan Tani Hutan (BTH). Barisan Tani Indonesia (BTI) cleared land in the forest and brought many people to manage the cleared land. This continued until the population reached 2,560 people in 1966 [15] and increased yearly. Land clearing also continues to increase. In 1971, based on a letter from the District Head of Central Lampung, the forestry police of the forestry agency vacated the community at the register 38, Gunung Balak. The evacuation was carried out by force resulting in clashes with the community and causing fatalities. The detailed history of tenure conflicts in register 38 Gunung Balak is presented in table 1.

Table 1. The history of Tenurial Conflicts on the Register 38 Gunung Balak

Year	Description
1935	Gunung Balak is designated as a protected forest area register 38 through Resident Besluit No. 664 in 1935 with an area of 19,680 ha
1960s	Communities begin to occupy protected forest areas of Gunung Balak Forest encroachment by Barisan Tani Indonesia (BTI) covering an area of 1,200 hectares Barisan Tani Indonesia (BTI) is arrested, and people are prohibited from expanding forest encroachment
1970s	Other communities began to arrive and build hamlets There is forest encroachment by the communities Formation of village administrators in several areas There was an order to vacate the area, and there were clashes between the community and murdered a civil service officer while trying to expel the community The Governor of Lampung Province issued Decree Number: G/85/D.I/HK/74 concerning establishing the Gunung Balak Representative village, covering one definitive village of Bandar Agung and 12 preparatory villages The Governor issued a Decree Number: G/88/D.I/HK/1974 concerning the designation of ±11,500 ha of the upstream area of Way Jepara Lake as a catchment area. An area of 7000 ha is in Gunung Balak protected forest area of Register 38 Through another Governor's Decree, the catchment area of Way Jepara is increased to 12.113 ha

The 1980s	<p>Minister of Forestry through Decree No. 213/KPTS-VII/84 dated October 25, 1984, approved the addition of the forest area of Gunung Balak from 19,680 to 24,248.30 ha</p> <p>The area is starting to be tagged with red and yellow poles so that there is chaos in the community</p> <p>The Gunung Balak community began to be moved through the transmigration program. However, the people who were transmigrated were disappointed, because the area they were going to was no better than the Gunung Balak area</p> <p>Through the Governor's Decree No. G/245/B.III/HK/1984 abolished the villages of Bandung Jaya, Way Abar, Ogan Jaya, and Yabakti. Decree No.G/281/B.ITII/HK/1986 abolished the villages of Srikaton, Srimulyo, Srikaloka, Sriwidodo, and Sidodadi. With this decree, the Gunung Balak Representative disability was also abolished.</p>
1990s	<p>Massive demonstration on August 26-27th, 1998. The community urged that their area, which had been designated as the catchment area of Way Jepara Lake, be returned</p> <p>Formation of team 13 consisting of local government officials and representatives of the DRL (Lampung People's Council), tasked with finding the fastest possible solution</p> <p>There was an agreement to remove the villages from the forest area, but the community violated the deal by continuing to land tenure in a forest area.</p>
2000s	The community continues to control and is active in farming in the Gunung Balak area
2010s	There was a massive demonstration in 2017. The community demanded to release the area from the forest area
2020s	<p>BPDAS WSS has started to approach forest and land rehabilitation through the diplomacy of siger avocado as a superior seeds</p> <p>There are still two groups of communities; (1) communities who do not want to cooperate with the government and still demand the release of the area and (2) the communities who want to collaborate with the government</p>

Source: Primary research data

Conflict must be managed because in reality conflict can lead to constructive and positive outcomes depending on how people manage it [16]. Conflict resolution cannot be done only by enforcing laws. An alternative approach for conflict resolution (APK) must be taken. Conflict resolution is a process of achieving conflict outcomes using conflict management methods based on two dimensions, that are cooperation and assertiveness [17]. Conflict resolution addresses the causes of conflict and seeks to establish new and lasting relationships between hostile groups [18]. Farmers' motivation to own land in protected areas (tenure) is the cause of high forest encroachment [19].

3.2 Superior seeds as a Conflict Resolution at Register 38, Gunung Balak

Conflict resolution is not just about the interests of one party. It is also necessary to find a solution in which the goals of each party to the conflict meet at a point in the middle. Community empowerment is one way of conflict resolution by determining the appropriate approach. The results showed that the community in the forest rehabilitation area and land register 38 Gunung Balak had a high preference for superior seeds of the avocado called "Pokat Siger Ratu Puan". Based on this opportunity, BPDAS WSS carried out forest and land rehabilitation based on community aspirations, using superior seeds of Pokat Siger Species selected by community.

Since RHL began to consider community interests in 2019, especially regarding the development of avocado "Pokat Siger Ratu Puan" seeds, social changes began to occur in the community. This includes changes in the community's perception of forest and land restoration and an improvement in public knowledge. This can be seen in the community's

growing interest in participating in RHL programs, which are increasing significantly each year. The increase in RHL acres is shown in Table 2.

Table 2. Land Area of RHL activities in Register 38 Gunung Balak

Year	Land Area (hectares)
2020	15
2021	212
2022	715
Total	942

Source: Primary data

From the table, it can be seen that there has been an increase in the area of RHL activities in Register 38 Gunung Balak since the implementation of forest and land rehabilitation based on superior seeds in 2020. Previously, forest and land rehabilitation activities had never been successful, where the planted plants were always gone.

The communities are interested in developing the "Pokat Siger Ratu Puan" plant because they learn from people who have planted it before and it has been proven to be easy to grow, with high yields and high selling prices. This activity is also can create a new livelihood for the community. Siger seed nurseries in various villages began to develop through farmer groups. Farmer groups can sell up to tens of thousands of seeds every month.

The community began to understand knowledge related to institutions. In 2020, forest farmer groups (KTH) began to develop based on the location of adjacent land. In 2022, the community took the initiative to establish a cooperative to regulate the marketing of seeds and pokat harvests, which are predicted to start producing in 2023. This is needed to control the market for seeds and fruit that will begin to be produced.

Based on the research result, the conflict resolution schemes using superior seeds can be a solution to tenure conflicts at register 38 Gunung Balak. However, given the prolonged tenure conflicts, gaining the community's trust takes more time and effort. Some people are still apathetic because they are worried that the incoming program will cause them to be expelled from register 38 Gunung Balak.

3.3 The Impact of Forest and Land Rehabilitation Activities on local communities

The impact of the Agroforestry Pattern RHL activity with the Superior Seed Scheme on social aspects, in general, has improved people's mindsets and perceptions of RHL activities. Some of the people in Register 38 Gunung Balak, who was initially always apathetic about RHL activities began to believe that RHL activities were able to improve their welfare. The high level of community enthusiasm positively influences the level of participation in RHL activities. Many community members who initially rejected RHL activities are now starting to take an active role in RHL activities.

Economically, RHL activities have improved the welfare of the community. RHL activities has stimulated the community to create employment opportunities such as grafting avocado nursery centres, seed grafting services and field study facilities for students, farmer groups and institutions and the community. The nursery centres built by the community can meet the needs of seeds not only in the East Lampung area but also in various areas inside and outside Lampung Province.

Pokat Siger can be harvested from the age of 3 years and produces 50-100 kg/tree annually, with 250-300 trees on 1 hectare. The price of pokat Siger per kg can reach 30 thousand / kg for grade A and 10 thousand / kg for grade C.. If in one hectare there are an average of 250 trees with an average sale of 25 thousand / kg and yield of 50 kg, each year can produce around 312.5 million/year. Reduce maintenance costs by fertilizing, weeding and pruning; the community still benefits more than 200 million annually.

From an ecological aspect, the shape of vegetation cover in a landscape has a reciprocal relationship to the biodiversity in the landscape [20]. This means that the presence of vegetation in a location increases the carrying capacity of the area for wildlife and other organisms. Based on the research results, planting several types of plants with superior seeds in the RHL area positively affects soil fertility. The biological analysis results showed that the number of microbes (mycorrhizae and rhizobium) that contributed to soil fertility was more in the planted areas resulting from rehabilitation activities (Table 3).

Table 3. The average number of mycorrhizae and rhizobium in RHL and non-RHL areas

Location	Number of mycorrhizae	Number of Rhizobium (CFU/g)
RHL Area	35	15,57 x 10 ⁸
Non-RHL Area	29	7,65 x 10 ⁸

Source: Primary data

In addition, in general, more animal species were found in areas where RHL was conducted than in areas without RHL, especially animals from the bird class. During the survey, 36 bird species were found in the RHL area and 28 bird species in the non-RHL area.

4. Conclusion

Tenure conflicts in Register 38 Gunung Balak have occurred since the 1960s. There are two types of conflicts in Register 38 Gunung Balak, which are land tenure and over the use of natural resources. Conflicts that occur in the area of forest and land rehabilitation have hampered RHL activities. Collaborative management using superior seeds is one solution that can be applied in the 38 Gunung Balak register area for conflict resolution. This is due to the high community preference for planting select types of plants. The type of plant chosen is Pokat Siger. Pokat siger is a plant that is easy to grow, produces fast, has prominent fruit characteristics and tastes good. Siger avocado can be harvested from the age of 3 years and can produce 50-100 kg/stem per year. The Agroforestry Pattern of RHL Activities with Superior Seeding Scheme positively impacts the social, economic and ecological aspects.

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