



# Vegetative methods and dune renegotiation as efforts to restore functions and minimize natural disasters

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## ABSTRACT

The dune plays a crucial role in the community life of Sumberkejayan Village, Mayang Subdistrict, Jember Regency. The decline in its functionality began in 2017, coinciding with a tornado and a reduction in the water discharge from community water sources around the dune. In response to these developments, the team initiated a program aimed at restoring the functionality of the dune within the Sumberkejayan Village area. The objective of this program is twofold: to reinstate the functionality of the dune and to emphasize the importance of caution in the buying and selling of dunes by its owners. Vegetative and renegotiation methods are employed through replanting (reforestation) using Sengon Solomon planting media. Sengon Solomon was selected for its rapid development compared to other types of sengon. Concurrently, renegotiation serves as a remedy in the buying and selling process, addressing disparities in agreements regarding dunes. Renegotiation provides alternative solutions for disadvantaged parties, aiming to restore the terms of the agreement and the conditions of the involved parties.

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## 1. INTRODUCTION

The decline of dune function in Jember Regency has become a serious issue as a support system for the livelihoods of communities and other living beings, including the residents of Sumberkejayan Village, Mayang District, Jember Regency. Dunes serve various functions, one of which is as a water catchment area and windbreak. When exploited, they yield sand and stones used as construction materials for promising property development businesses over the past five years since 2017 (Fadhilah, 2022). The exploitation of dunes typically yields useful C materials for construction purposes. Currently, some dunes in Sumberkejayan Village, Mayang District, Jember Regency have been sold (exploited). While some are sold, once depleted of sand and stones, these dunes are left without reclamation or restoration efforts, leading to a decline in their function and making them susceptible to whirlwind disasters during the rainy season. Abandoned dunes, without reclamation efforts, are often left untended, even though some of them could still be cultivated. However, due to their height, erosion easily occurs, as there are no plants to stabilize the dune soil. The cancellation of dune sales undoubtedly harms dune owners.

Furthermore, dune owners are requested to refund the agreed-upon amount for the sale of dunes in full, despite the lack of reclamation efforts.

The weakened position of sellers in this situation has drawn the attention of a team to empower partners (dune owners and communities surrounding the dunes) in Sumberkejayan Village, Mayang District, Jember Regency. This initiative invites partners to collaboratively restore dune functions from environmental and civil law perspectives in agreements concerning the sale of dunes that are canceled after exploitation. This program aims to restore exploited dunes using vegetative methods. Meanwhile, the restoration of seller rights can be achieved through renegotiation methods with the goal of exercising greater caution in agreements, particularly regarding dunes as community assets and natural resources. The use of Solomon Sengon seedlings in vegetative methods shows promising potential compared to other plants due to the rapid development of Solomon Sengon seedlings, aiming to maximize exploited dune areas. Moreover, Sengon, as an economic commodity in community forests, is considered quite prospective and promising from a financial aspect (Priadi & Hartati, 2014; Zakiyah et al., 2017).

Solomon Sengon (*Falcataria moluccana* (L.) Nielsen Solomon) originates from the Solomon Islands. At two years old, Solomon Sengon has a diameter of 16 cm, while local Sengon at the same age has a diameter of 12 cm. Additionally, the productivity of Solomon Sengon is three times higher than that of local Sengon, which is currently widely cultivated on the island of Java. In Indonesia, Solomon Sengon is still rarely cultivated by communities, primarily due to the expensive price of seeds and challenges posed by the rust tumor disease that commonly affects Sengon trees (Ikhfan, 2019). The aforementioned reasons reinforce the widespread cultivation of Sengon as community forests and timber forests due to its advantageous characteristics, such as being able to grow in various climatic conditions, not requiring high-altitude growing conditions, and being multifunctional.

Renegotiation methods serve as a means to balance the positions between buyers and sellers, avoiding mutual harm while providing mutual benefit. Negotiations involve parties with interests, engaging at least two parties to achieve shared objectives, and negotiations are often undertaken by individuals consciously or unconsciously. The negotiation process typically involves bargaining over each party's interests, aiming to reach an agreement among the parties or negotiators. Based on the experience of dune owners who have had to refund a sum of money without reclamation efforts, the team is increasingly convinced that communities need legal insights when entering into agreements. Both parties are equally disadvantaged, hence there is an alternative to renegotiate (re-negotiate).

Based on the experiences of dune owners and communities surrounding the dunes, this service program aims to raise environmental and legal awareness among dune owners, communities surrounding the dunes, and village officials in Sumberkejayan regarding the restoration of dune functions, which play a crucial role in the lives of communities around the dunes. Additionally, this program aims to instill principles of caution in buying and selling (dunes) as assets and natural resources by restoring the positions and statuses of all parties. However, the hope is not only for dune transactions but also for transactions involving other objects. Both methods minimize disasters and disputes.

## **2. METHODS**

The community service activities were conducted in Sumberkejayan Village, Mayang District, Jember Regency. The implementation of these activities commenced in October 2023, involving partners such as dune owners, the communities surrounding the dunes, and village officials in Sumberkejayan Village. Several methods were employed during these activities, including vegetative methods and renegotiation through the formation of a Dune Enthusiast Community. Vegetative methods are typically

utilized in soil conservation, where plants or plant residues are employed to reduce erosion. Plants or plant residues serve as soil protectors against the impact of raindrops and surface runoff, while also enhancing water infiltration into the soil (Subagyo et al., 2003). The vegetative method proved capable of restoring dune functions as soil that had been exploited, serving as the highest water catchment area around Sumberkejayan Village.

Renegotiation is necessary to provide legal consultation to dune owners and village officials, aiming to minimize any party being disadvantaged in an agreement through renegotiation. A case in Sumberkejayan Village involved the sale of exploited dunes, where the seller was requested to refund the agreed-upon amount without reclamation. Review or renegotiation (renewed agreements) entails a two-way communication process, with the first party as the communicator and the second party as the communicatee, both alternately expressing their respective interests (Roeroe, 2018). As for the formation of the Dune Enthusiast Community, it serves as a driving force for the communities surrounding the dunes. Here, community refers to a group of individuals interacting with each other and sharing common goals. Groups are natural formations as humans, being social beings, interact with one another, forming specific groups (Ayu et al., 2019). The objective of establishing the Dune Enthusiast Community is uniform to preserve dune functions and environmental quality in Sumberkejayan Village, thereby preventing further dune transactions and avoiding environmental degradation in the dune vicinity.

The success indicators of this program include the reforestation of dunes using vegetative methods with Solomon Sengon seedlings as a medium, enabling the dunes to regain their function as water catchment areas and prevent erosion and whirlwind disasters in the future. Additionally, the program aims to enhance public awareness regarding the importance of renegotiation in all forms of agreements, including dune sales agreements. The establishment of the Dune Enthusiast Community also serves as a platform for the communities around the dunes to oversee dune exploitation activities that may adversely affect the surrounding communities.

### **3. RESULTS AND DISCUSSION**

#### **Results**

The outcomes of this activity are divided into two methods: vegetative methods and renegotiation, aimed at restoring the function of dunes, supported by the establishment of the Dune Enthusiast Community as a system that significantly influences environmental quality. Dunes possess not only economic but also ecological value. The approach of moral and religious values serves to broaden community awareness regarding dunes as a collectively owned entity, particularly effective considering the majority Islamic population, who are more readily approached through religious and moral values. Dunes, as environmental systems, play a vital role in life and interact systematically, affecting each other mutually.

Environmental issues always pose complex challenges due to their involvement of numerous components, higher uncertainty, and the requirement for long-term solutions (Soesilo, n.d.), including the dune issues in Sumberkejayan Village. Ecosystems, being combinations of living organisms and environments, are structured concepts, systems, and units with functions. Meanwhile, the environment encompasses all entities, conditions, states, and influences within a space we inhabit, affecting living beings, including human life. Emil Salim's perspective emphasizes the interdependence of environmental influences, signifying that if the upstream environment is damaged, the downstream environment will

also suffer. Hence, achieving sustainable environmental development necessitates total consideration for living quality, both presently and in the future, by not only ecological but also sociological and economic aspects, as integrated environmental management can lead to environmental sustainability (Effendi et al., 2018).

Renegotiation requires good faith from both parties to ensure that agreements are executed in line with their initial objectives. Good faith extends not only to the time of establishing relations but also to the time of executing the rights and obligations arising from legal relationships (Harahap, 2022). As stipulated in Article 1338 paragraph (1) of the Civil Code, valid agreements are binding as law for those who make them (*pacta sun servanda*). Renegotiation efforts may involve refunding money and reclamation efforts on dunes following their exploitation. Renegotiation provides an alternative for parties to negotiate in good faith, aiming to redefine the rights and obligations of each party without invalidating the underlying agreement. Restoring the positions of the parties by prioritizing consensus-based deliberation and reaching mutually beneficial agreements is crucial.

The low legal awareness of dune owners, particularly and the general community in Sumberkejayan Village, affects their understanding of engaging in sales agreements. However, after this program, the community has become acutely aware that all agreements should ideally be in writing and the importance of witnesses in the sales process, coupled with the significance of alternative dispute resolution mechanisms if either party is disadvantaged in the future. Consequently, dune owners gain legal knowledge and understand the legal recourse available in case of disputes, aligning with the goal of enhancing legal awareness to encourage greater compliance with and understanding of the law among the community (Purwaningsih et al., 2017). Renegotiation methods serve as a solution to restore the positions of both parties, ensuring that they maintain equal standing.

## **Implementation Stages**

### **Consultation and coordination with partners**

The consultation and coordination stage (Figure 1) is the initial stage in implementing the service program by explaining several stages, media and materials that will be included in achieving this service program. This stage provides an overview of the activities that will be carried out. This aims to provide awareness of the importance of restoring the function of the dune and providing alternative solutions to sales and purchases that are unilaterally canceled by renegotiation.

### **Choosing planting media**

The stages of selecting planting media (Figure 2) aim to provide insights and restore the function of exploited dunes or those experiencing functional decline to minimize natural disasters, especially whirlwinds. However, the selection of planting media still has shortcomings due to the harvest period of 5-6 years for dunes undergoing reclamation with vegetative methods. Community service activities using vegetative methods employ Solomon Sengon seedlings as planting media. The choice of Solomon Sengon is justified by its rapid growth compared to other local Sengon varieties. Research conducted by Agus indicates that Solomon provenance Sengon exhibits faster growth compared to local Sengon varieties (Setiadi et al., 2014). Moreover, the growth of Solomon Sengon is three times more productive than local Sengon commonly found in Indonesia. Setiadi's research also suggests that Solomon Sengon plants are more resilient when exposed to rust tumor disease.



Figure 1. Coordination with partners

Figure 2. Selection of planting media for Solomon Sengon in the vegetative method

### Methods' implementation

The community service activity (Figure 4) implements vegetative methods through the planting of Solomon Sengon seedlings in Sumberkejayan Village, Mayang District, Jember, involving the community, particularly dune owners, and the surrounding community. The first step is to raise awareness about the function of dunes using vegetative methods, emphasizing the value of Sengon wood for many residents in the Tapal Kuda region, including the importance of renegotiation in agreements. Similarly, in other areas, Sengon wood contributes significantly to farmers' income, such as in Wonosobo, Central Java, where Sengon accounts for over 50% of the area, being a major production center for Sengon wood (Heru et al., 2009). There are various approaches to erosion control, one of which is vegetative methods. Vegetative methods prevent erosion by protecting, reducing water velocity, retaining sediment particles, and maintaining soil stability in absorbing water. This method plays a crucial and influential role in a location, protecting the soil from damage caused by rainwater droplets (Nura'ban, 2006). Moreover, most of the essential nutrients required by plants are supplied through the planting media, which are then absorbed by the roots and utilized for plant physiology. Good planting media are characterized by their ability to absorb water well, providing ample pore space so that oxygen can still be obtained through the roots when the soil is wet (Cahyanti et al., 2017).



Figure 3. Educating of the function of dunes as a living environmental system



Figure 4. Consultation in renegotiating agreements



Figure 5. Symbolic handover of seeds to the dune owner

Guidance is provided through consultation sessions (Figure 3) on making agreements and the importance of alternative solutions in case of disputes (cancellation, as in the case of dune sales in

Sumberkejayan Village) through renegotiation methods regarding nominal values and dune reclamation efforts. Consultations are conducted simultaneously with the awareness-raising activities, considering the limited time available for this program. The implementation of alternative renegotiation involves providing education on agreement-making, particularly to dune owners. These sessions provide an understanding to dune owners, the surrounding community, and village officials about the importance of written agreements, the benefits of involving witnesses (village officials), and alternative dispute resolution methods in agreements. Both methods are reinforced by the formation of the Dune Enthusiast Community in Sumberkejayan Village, serving as the driving force for dune enthusiasts within the community (Figure 7).



**Figure 6.** Implementation of the vegetative method using Sengon Solomon media in Sumberkejayan Village, Mayang District, Jember Regency

**Figure 7.** Formation of a community of gumuk lovers marked by the signing of a declaration in Sumberkejayan Village, Mayang District, Jember Regency

## Closing

This stage marks the conclusion of the community service program, attended collectively by all participants. The activity proceeded smoothly, and partners expressed hopes for not only dune-related initiatives but also other activities fostering community awareness in various fields. The program adhered to the schedule, following the outlined stages and concepts of community service. The alternative renegotiation method was deemed effective by partners as it provided a solution within agreements to uphold the positions of all parties involved.

## Activities' reference

This community service program has been adapted to the results of research by the implementing team and research results from various references related to environmental law as well as alternatives to

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Nurul Laili Fadhilah, Bayu Dwi Anggono, Pratiwi Puspitho Andini, Rosita Indrayati

renegotiation in agreements. The implementation of this service program is divided into several activity sessions which are described in Table 1.

**Table 1.** Service activity meeting schedule

<b>1<sup>st</sup> Meeting</b>	
Activities	<ul style="list-style-type: none"><li>- Coordination with partners</li><li>- Introduction of service programs</li><li>- Introduction to planting media</li></ul>
Goals	<ul style="list-style-type: none"><li>- Introduction to planting media</li><li>- Explanation of the function of dunes for the environment</li><li>- Explanation of renegotiation in agreements in the civil sector</li></ul>
<b>2<sup>nd</sup> Meeting</b>	
Activities	<ul style="list-style-type: none"><li>- Selection of planting media</li><li>- Process of cleaning the dune</li></ul>
Goals	<ul style="list-style-type: none"><li>- Explain the requirements for the vegetative method on dunes</li><li>- Introduction of renegotiation in agreements in the civil sector</li></ul>
<b>3<sup>rd</sup> Meeting</b>	
Activities	<ul style="list-style-type: none"><li>- Implementation of the vegetative method is carried out by replanting on dunes that have not been and/or have been exploited.</li><li>- Socialization of dune functions and renegotiation in community empowerment activities regarding sale and purchase agreements, especially on dunes that have been exploited and cancellation of dune sale and purchase agreements.</li></ul>
Goals	<ul style="list-style-type: none"><li>- Carrying out reclamation of dunes where the dune function has decreased</li><li>- Provide an understanding of the importance of written agreements, the benefits of presenting witnesses and alternative dispute resolution in agreements</li><li>- Formation of a community of sand lovers in Sumberkejayan Village</li></ul>
<b>4<sup>th</sup> Meeting</b>	
Activities	<ul style="list-style-type: none"><li>- Conveying messages and impressions from the dune owner and the community around the dune</li><li>- Delivery of closing remarks and thanks to partners</li><li>- Chanting prayers</li><li>- Closing</li></ul>
Goals	<ul style="list-style-type: none"><li>- To find out the experiences of the dune owners and the communities around the dune</li><li>- Expressing gratitude that the activities in this program received a positive response from the community and local village officials.</li></ul>

## Discussion

Sumberkejayan Village, prone to natural disasters like tornadoes during the rainy season, is deemed critical by participants for restoring the function of dunes. Dunes serve as windbreakers during windy conditions and as water retention areas for the surrounding community. The planting of Solomon Sengon seedlings using vegetative methods in dunes owned by scattered community members in Tegal Hamlet, Krajan Hamlet, and Mrapen Hamlet is imperative. Sengon, a widely cultivated timber in Indonesia, holds significance in industrial raw material production, as evidenced by the Central Bureau of Statistics in 2015 reporting a 50,437 million/m<sup>3</sup> increase in wood production for industrial raw materials in 2013 compared to 2012 (49,258 million/m<sup>3</sup>) and 2011 (47,429 million/m<sup>3</sup>). The largest contribution to

wood production is from plantation forests, amounting to 29.67 million/m<sup>3</sup>. Sengon is a plantation forest commodity known for its ease of cultivation, rapid growth, and commercial value.

The selection of Sengon Solomon as a planting medium in the vegetative method to restore dune function is crucial, especially with the diminishing dunes in the Sumberkejayan Village area, which poses a risk of tornadoes and erosion during the rainy season. Like other soils, dunes feature holes and biopores as spaces for plants and animals. These are formed by the growth and development of plant roots in the soil, as well as the increasing activity of soil fauna such as earthworms, termites, and ants that dig holes in the soil. The vegetative method using Sengon Solomon aims to minimize natural disasters, particularly tornadoes, in the Sumberkejayan Village area.

The vegetative method is perceived as more effective, considering that exploited dunes lack reclamation efforts. Additionally, the reduced water supply around the dunes, evident by decreased water levels in the wells of surrounding communities during the dry season, underscores the necessity for careful dune management as a community asset. This program comprises several sessions, starting with dune function socialization, consultation on contract renegotiation, and the establishment of the Dune Enthusiast Community in Sumberkejayan Village. The activity received positive responses, with several questions raised during the consultation session, even beyond legal themes.

The application of the vegetative method proves beneficial for dune owners in restoring dune function, which will eventually lead to the harvesting of Solomon Sengon seedlings. The program's success is also evident in participants' understanding of environmental and civil law, particularly in contracts. Participants recognize the importance of involving witnesses, such as neighbors or village officials, in written agreements to prevent disputes. Renegotiation as an alternative dispute resolution in civil matters is acknowledged. Good faith is essential in renegotiation to ensure that agreements align with their initial objectives.

Although renegotiation may not be preferred by all parties, it is sometimes necessary to amend written agreements to maintain equal positions for all involved parties. Education levels among human resources play a role in community issues, as most dune owners have only completed junior high school. Community participation can help restore dune function through conservation via vegetative methods or reclamation, starting from the nearest areas. Observations in the field have revealed instances of village officials' involvement in unilateral cancellations, underscoring the need for community education on proper procedures for dune contracts. Dunes play a vital role in supporting human and other living beings' lives, as they serve as wind barriers and water sources for the surrounding areas.

Collaboration, relationships, and communication with implementing partners in this community service program have been effective. Partners' enthusiasm for planting aligns well with their profession as dune owners, although limitations in seed distribution to all dune owners in Sumberkejayan Village suggest the need for continued similar activities to preserve and restore dune function fully.

#### **4. CONCLUSION AND RECOMMENDATIONS**

The community service program aims to cultivate awareness among partners regarding the preservation of gumuk function and the necessity of renegotiating agreements. This program encompasses three main points: reforestation of gumuk using vegetative methods with Sengon Solomon as the medium, empowerment of the community through alternative renegotiation of agreements, and establishment of a community of gumuk enthusiasts (Mata Gumuk). At each stage of the activity, socialization is conducted to uphold the function of gumuk, enhancing community awareness of alternative renegotiation in agreements. This ensures that gumuk owners exercise caution in conducting



gumuk transactions to avoid favoring one party. Gumuk plays a crucial role in the lives of the people in Sumberkejayan Village, serving as windbreakers and water catchment areas for the surrounding community.

The limitations of this program include the inability to prohibit gumuk sales due to their status as property rights, thus allowing freedom akin to property rights as one of the land rights. Economic factors drive gumuk owners to sell their property, and the program is confined to the village level, which remains relatively limited in scope. There is a need for gradual engagement with gumuk owners led by the community of gumuk enthusiasts, as the process of gumuk exploitation also requires permission from the local village government, at least from the Village Head granting authorization. Village officials, as facilitators and mediators, must be more proactive in resolving disputes, given that existing disputes significantly impact the sustainability and function of gumuk in Sumberkejayan Village, Mayang District, Jember Regency. Furthermore, there is a necessity for stringent policies from the village government regarding village roads to prevent gumuk exploitation activities that could damage the function of gumuk in Sumberkejayan Village, Mayang District, Jember Regency.

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