BUMI: International Journal of Environmental Reviews
Vol. 02, No. 01, (2024): pp. 112-116
DOI: 10.30631/201.112-116
ISSN: 2987-9477

Original Research Article

Analysis of the Success of Revegetation in Reclamation Plant Growth Percentage Aspect in Tanah Bumbu Regency, South Kalimantan

Arrina Khanifa*[1], Rabiatul Adawiyah[1]
[1]*Program Studi Teknik Pertambangan, Politeknik Batulicin, Tanah Bumbu, 72211, Indonesia*

ARTICLE INFO

Keywords:
Mining,
reclamation
success,
plant growth

ABSTRACT

Mining is a vital activity for the management and utilization of natural resources, serving as a source of foreign exchange for national development. However, mining often causes environmental damage, necessitating reclamation and revegetation efforts. Revegetation can be considered a vegetative technique applied in rehabilitating lands damaged during mining. This study involved primary data collection, specifically measuring plant growth and calculating growth rates. The research results from 2021, 2022, and 2023 indicate a continuous increase in growth percentages, suggesting successful reclamation in the study area.

* Corresponding author.
E-mail: arrinakhanifa22@gmail.com (Arrina Khanifa)

Received July 10, 2024; Received in revised form July 29, 2024; Accepted July 30, 2024
Available online August 5, 2024

1. INTRODUCTION

Indonesia is rich in natural resources, making it an attractive destination for large companies, particularly those interested in utilizing these resources economically. One of the most heavily exploited resources is mineral resources. These minerals can be harnessed for the welfare of society through mining activities (Gautama et al., 2021).

Mining is an activity that involves the management and utilization of natural resources with the potential to serve as a source of foreign exchange for national development. However, mining activities often cause environmental damage, which must be mitigated through reclamation and revegetation efforts. Reclamation is the process conducted at every stage of mining operations to organize, repair, and enhance ecosystem and environmental quality in order to enable them to resume serving their intended purpose (Minister of Energy and Mineral Resources Regulation No. 7 of 2014).

Reclaimed land is ready to be planted with vegetation as an effort to restore its original function. The success rate of revegetation depends heavily on the suitability of the selected plant species, land preparation including slope and water channel arrangement, soil processing, as well as the maintenance of plants and the land as their growing medium (Islami et al., 2023).

The aim of this research is to analyze the success of post-coal mining revegetation based on the plant growth percentage at a mining area, located in Tanah Bumbu Regency, South Kalimantan. The criteria and indicators for evaluating the success of reclamation are reviewed based on the percentage of plant growth and health according to the Ministry of Forestry Regulation Number: P.60/Menhut-II/2009.

2. METHODS

The methods used for percentage of Plant Growth are divided into two parts: (1) collecting secondary data in the form of the reclamation area size, (2) collecting primary data by measuring tree height and identifying plant species. The percentage of plant growth is determined by comparing the number of living plants to the total number of plants planted in the observed sample plot. The percentage of plant growth is calculated using the formula as per Rizal et al. (2020):

$$\text{Percentage of Plant Growth} = \left(\frac{\text{Total number of plants planted}}{\text{Number of living plants}}\right) \times 100$$

This formula calculates the percentage of successfully grown plants relative to the initial planting in the observed plot

4. RESULTS AND DISCUSSIONS

The research results discuss field observations, including calculations of the percentage of plant growth. Based on the results from Table 1, the average percentage growth obtained was 85.33% in 2021, 85.54% in 2022, and 85.62% in 2023.

Table 1. Percentage of Growth of Sengon, Balsa, and Average Percentage of Growth for Each Research Plot and Planting Year

No Plot	The number of plants that have grown in Plot I	The number of plants planted in Plot I	Percentage of Plant Growth (%)
Reclamation and Revegetation Area in 2021			
PLOT 1	180	210	85.72%
PLOT 2	177	210	84.28%
PLOT 3	179	210	85.23%
PLOT 4	180	210	85.72%
PLOT 5	180	210	85.72%
Quantity	896	1050	426.67%
Average	179.2	210	85.33%
Reclamation and Revegetation Area in 2022			
PLOT 1	185	210	88.09%
PLOT 2	185	210	88.09%
PLOT 3	183	210	87.14%
PLOT 4	185	210	88.09%
PLOT 5	185	210	88.09%
Quantity	923	1050	439.50%
Average	184.6	210	85.54%
Reclamation and Revegetation Area in 2023			
PLOT 1	188	210	89.52%
PLOT 2	188	210	89.52%
PLOT 3	187	210	89.04%
PLOT 4	188	210	89.52%
PLOT 5	188	210	89.52%
Quantity	939	1050	447.12%
Average	187.8	210	85.62%

(Source: Researcher, 2024)

In the research area, there are three types of plants: Solomon Sengon (Falcataria moluccana), Sea Sengon (Faraserientis palcataria), and Balsa (Ochroma grandiflorum Rowlee). The land area was 8.48 hectares in 2021, 9.60 hectares in 2022, and 9.14 hectares in 2023.

The company which operated at this mining area chose Sengon and Balsa plants for reclamation because these two types of plants are very popular in Indonesia, especially in South Kalimantan. They were selected due to their fast growth and diverse benefits. Sengon and Balsa belong to the pioneer species category and are often used for timber production, environmental conservation, and reforestation programs. Besides being easy to cultivate, both tree species have high economic value.

The percentage growth of plants from 2021 to 2023 shows an increase each year, as seen in Table 1. Sufficient organic matter availability or good fertilization can enhance soil fertility chemically, physically, and biologically. The content and presence of organic matter significantly influence plant growth. The growth of Balsa and Sengon plants can be observed in Figure 1 and Figure 2.

Figure 1 (a) Balsa Trees (b) Sengon Trees
(Source: Researcher, 2024)

5. CONCLUSION

Evaluation of the success rate in compliance with Minister of Forestry Regulation No. P.60/Menhut-II/2009 regarding revegetation assesses only two criteria: the percentage of plant growth and the percentage of plant health. This study focuses solely on the aspect of plant growth percentage. From the available data, there is a clear increase in the percentage of plant growth from 2021 to 2023, indicating that the revegetation program in the reclaimed area is becoming more effective each year. The high and consistent percentage of plant growth across all plots demonstrates stability in the implementation of revegetation methods and the land's ability to support plant growth.

Acknowledgement

Thank you to everyone who participated in this research

References

Gautama, G. A., Novianto, D., & Suhardono, A. *(2021). Sumberdaya, cadangan, produksi mineral dan batuan provinsi Jawa Timur tahun 2018. Jurnal Qua Teknika, 11(1), 52-66.*

Islami, R. H., Fatah, L., Kissinger, K., & Badaruddin, B. (2023). Penggunaan Parameter Vegetasi Dalam Menentukan Tingkat Keberhasilan Reklamasi. *EnviroScienteae*, *19*(2), 61-66.

Kementerian ESDM. (2014). Permen ESDM No. 7 Tahun 2014 Tentang Pelaksanaan Reklamasi dan Pascatambang Pada Kegiatan Usaha Pertambangan Mineral dan Batubara. Peraturan Menteri ESDM, (274).

Kementerian Hukum dan Hak Asasi Manusia, K. (2009). Peraturan Pemerintah Republik Indonesia Nomor 60 Tahun 2009 Tentang Perlindungan Hutan, 4(1), 1–5.

Nugroho, A. W., & Yassir, I. (2017). Kebijakan penilaian keberhasilan reklamasi lahan pasca-tambang batubara di Indonesia. *Jurnal analisis kebijakan kehutanan*, *14*(2), 121-136.

Rizal, Ahmad, and Kissinger Kissinger. "Analisis keberhasilan revegetasi pasca tambang batubara di pd. baramarta kabupaten banjar provinsi Kalimantan Selatan." *Jurnal Sylva Scienteae* 3.1 (2020): 13-25.

Setyowati, R. D. N., Amala, N. A., & Aini, N. N. U. (2017). Studi pemilihan tanaman revegetasi untuk keberhasilan reklamasi lahan bekas tambang. *Al-Ard: Jurnal Teknik Lingkungan*, *3*(1), 14-20.

Triantoro, A. (2017). Studi Reklamasi Lahan Bekas Tambang Batubara PT Bhumi Rantau Energi di Rantau Kalimantan Selatan. *Jurnal Geosapta*, *3*(2).

Nugroho, A. W., & Yassir, I. (2017). Kebijakan penilaian keberhasilan reklamasi lahan pasca-tambang batubara di Indonesia. *Jurnal analisis kebijakan kehutanan*, *14*(2), 121-136.