PERBANDINGAN SIFAT FISIKA TANAH ANTAR KEDALAMAN PADA BERBAGAI KONDISI LAHAN BEKAS TAMBANG BATUBARA DENGAN REVEGETASI SENGON

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DHARMASRAYA
2026

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ABSTRAK

Aktivitas penambangan batubara menyebabkan degradasi sifat fisika tanah sehingga diperlukan upaya reklamasi melalui revegetasi untuk memulihkan kualitas tanah. Penelitian ini bertujuan menganalisis perbedaan sifat fisika tanah antar kedalaman pada masing-masing kondisi lahan bekas tambang batubara dengan revegetasi sengon (*Falcataria moluccana*). Penelitian dilaksanakan di PT Kuansing Inti Makmur, Kabupaten Bungo, Provinsi Jambi, menggunakan empat kondisi lahan, yaitu lahan sedang ditambang, revegetasi sengon umur 4 tahun, revegetasi sengon umur 12 tahun, dan lahan hutan. Sampel tanah diambil pada kedalaman 0-20 cm dan 20-40 cm dengan tiga ulangan pada setiap kondisi lahan. Parameter yang diamati meliputi tekstur tanah, bahan organik, berat volume, total ruang pori, permeabilitas, dan daya pegang air. Data dianalisis menggunakan uji normalitas Shapiro-Wilk yang dilanjutkan dengan uji *paired sample t-test* pada taraf nyata 5%, sedangkan daya pegang air dianalisis secara deskriptif. Hasil penelitian menunjukkan bahwa sebagian besar parameter sifat fisika tanah tidak menunjukkan perbedaan antar kedalaman. Perbedaan hanya ditemukan pada fraksi debu dan liat di lahan sedang ditambang, fraksi pasir dan liat di lahan revegetasi umur 12 tahun, serta berat volume di lahan sedang ditambang. Secara deskriptif, kandungan bahan organik meningkat dari lahan sedang ditambang hingga lahan hutan, disertai penurunan berat volume serta peningkatan total ruang pori, permeabilitas, dan daya pegang air. Dengan demikian, lahan yang telah direvegetasi menunjukkan kualitas sifat fisika tanah yang lebih baik dibandingkan lahan yang sedang ditambang, sedangkan perbedaan antar kedalaman umumnya tidak ditemukan.

Kata Kunci: Bahan organik, Berat volume, Kualitas tanah, Permeabilitas, Reklamasi

COMPARISON OF SOIL PHYSICAL PROPERTIES BETWEEN SOIL DEPTHS UNDER DIFFERENT LAND CONDITIONS OF POST-COAL MINING AREAS REVEGETATED WITH SENGON

ABSTRACT

Coal mining activities cause the degradation of soil physical properties, making reclamation through revegetation necessary to restore soil quality. This study aimed to analyze the differences in soil physical properties between soil depths under different land conditions of post-coal mining areas revegetated with sengon (*Falcataria moluccana*). The research was conducted at PT Kuansing Inti Makmur, Bungo Regency, Jambi Province, using four land conditions: active mining land, four-year-old sengon revegetation, twelve-year-old sengon revegetation, and forest land. Soil samples were collected from depths of 0-20 cm and 20-40 cm with three replications for each land condition. The observed parameters included soil texture, organic matter, bulk density, total pore space, permeability, and soil water retention. The data were analyzed using the Shapiro–Wilk normality test followed by a paired-samples *t*-test at a 5% significance level, while soil water retention was analyzed descriptively. The results showed that most soil physical properties did not differ significantly between soil depths. Significant differences were observed only in the silt and clay fractions under active mining land, the sand and clay fractions under the twelve-year-old revegetation, and bulk density under active mining land. Descriptive analysis indicated that organic matter content increased progressively from active mining land to forest land, accompanied by a decrease in bulk density and increases in total pore space, permeability, and soil water retention. Therefore, revegetated land exhibited better soil physical quality than active mining land, whereas differences between soil depths were generally not observed.

Keywords: *Bulk density, Land reclamation, Organic matter, Soil permeability, Soil quality*