KAJIAN SIFAT FISIKA TANAH LAHAN AGROFORESTRY PADA BEBERAPA KELAS LERENG DI NAGARI KOTO BARAPAK KECAMATAN BAYANG KABUPATEN PESISIR SELATAN

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ABSTRAK

Lokasi penelitian berlereng pada lahan Ultisol memiliki risiko tinggi mengalami kerusakan lahan akibat erosi dan kehilangan nutrisi yang cepat. Penelitian ini bertujuan menentukan sifat fisika Ultisol pada beberapa kelas lereng di lahan agroforestri Nagari Koto Barapak, Kecamatan Bayang, Kabupaten Pesisir Selatan. Penelitian dilaksanakan dari Februari 2024 sampai Oktober 2025 menggunakan metode survei dengan teknik pengambilan sampel acak bertujuan. Contoh tanah diambil dari kedalaman 0–30 cm pada tiga kelas lereng agroforestri, yaitu landai (8–15%), agak curam (15–25%), dan curam (25–45%), serta lahan hutan sekunder (lereng 25–45%) sebagai pembanding. Parameter yang dianalisis mencakup tekstur, kandungan karbon organik, bahan organik, berat volume (BV), total ruang pori (TRP), dan permeabilitas tanah. Hasil laboratorium menunjukkan tekstur tanah di semua kelas lereng agroforestri didominasi fraksi liat (kriteria liat), sedangkan hutan sekunder bertekstur lempung liat berpasir. Kandungan bahan organik tanah pada seluruh lereng agroforestri tergolong rendah (2,01%–2,36%) akibat erosi lapisan permukaan, sangat kontras dengan lahan hutan sekunder yang berada pada kriteria sedang (4,09%). Nilai BV (0,82–1,01 g/cm³) dan TRP (61,75%–69,01%) di semua lokasi penelitian masuk dalam kategori sedang. Laju permeabilitas tanah pada lahan agroforestri tergolong lambat hingga sangat lambat (0,44–1,30 cm/jam) seiring meningkatnya kecuraman lereng karena didominasi oleh pori-pori mikro tanah liat, sementara lahan hutan memiliki laju agak lambat (1,50 cm/jam). Kondisi fisik tanah lahan agroforestri di lokasi penelitian belum ideal sehingga memerlukan penambahan bahan organik berkala dan penerapan teknik konservasi tanah.

Kata kunci: *Agroforestry, kelas lereng, permeabilitas, sifat fisika tanah, Ultisol.*

STUDY ON SOIL PHYSICAL PROPERTIES OF AGROFORESTRY LAND ACROSS VARIOUS SLOPE CLASSES IN NAGARI KOTO BARAPAK, BAYANG DISTRICT, PESISIR SELATAN REGENCY

ABSTRACT

The sloping typographic conditions of Ultisols carry a high risk of land degradation due to rapid soil erosion and nutrient loss. This research aimed to determine the soil physical properties of Ultisols across various slope classes in agroforestry land in Nagari Koto Barapak, Bayang District, Pesisir Selatan Regency. The study was conducted from February 2024 to October 2025 using a survey method with a purposive random sampling technique. Soil samples were collected from a depth of 0–30 cm across three agroforestry slope classes: gently sloping (8–15%), moderately steep (15–25%), and steep (25–45%), with secondary forest land (25–45% slope) utilized as a control comparison. The analyzed parameters included soil texture, organic carbon content, soil organic matter, bulk density (BD), total pore space (TPS), and soil permeability. Laboratory analysis results revealed that the soil texture across all agroforestry slope classes was dominated by clay fractions (classified as clay), whereas the secondary forest land exhibited a sandy clay loam texture. The soil organic matter content across all agroforestry slopes was low (2.01%–2.36%) due to topsoil erosion, which contrasted significantly with the secondary forest land categorized in the medium criteria (4.09%). Bulk density values (0.82–1.01 g/cm³) and total pore space percentages (61.75%–69.01%) at all research locations fell into the medium criteria. Soil permeability rates in the agroforestry land ranged from slow to very slow (0.44–1.30 cm/h) corresponding to increasing slope steepness, as it was dominated by clay micropores, while the forest land exhibited a moderately slow rate (1.50 cm/h). The soil physical characteristics of the agroforestry land at the research site are not yet ideal, thereby requiring periodic organic matter application and the implementation of soil conservation techniques.

Keywords: *Agroforestry, bulk density, slope classes, soil permeability, soil physical properties, Ultisols.*

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