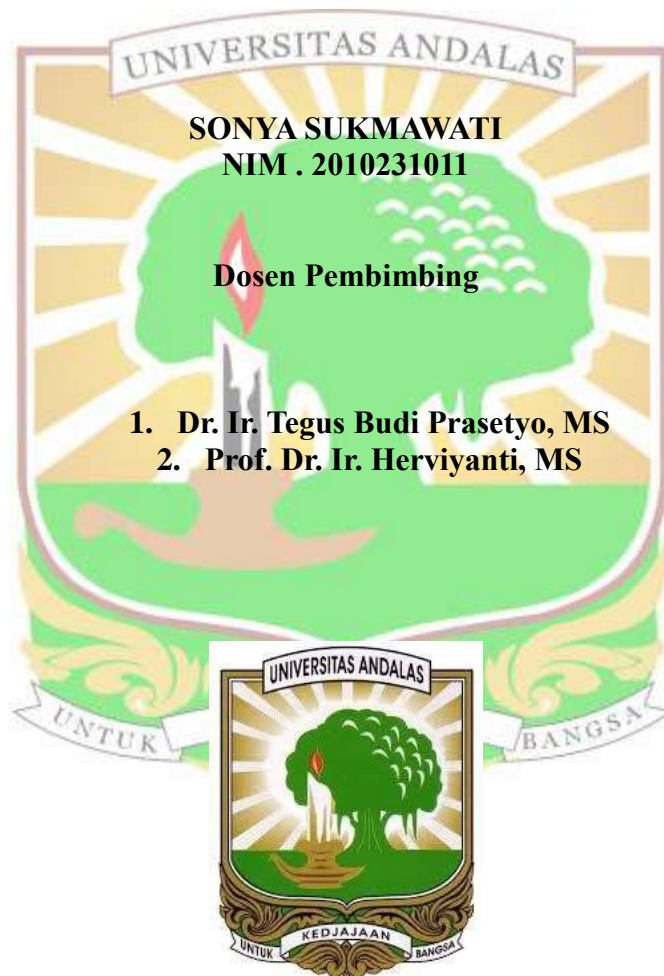


**KAJIAN CADANGAN KARBON ORGANIK TANAH
BERBASIS LERENG PADA LAHAN PERTANIAN INTENSIF
DI NAGARI KOTO BARU, KABUPATEN TANAH DATAR**

SKRIPSI

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**FAKULTAS PERTANIAN
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KAJIAN CADANGAN KARBON ORGANIK TANAH BERBASIS LERENG PADA LAHAN PERTANIAN INTENSIF DI NAGARI KOTO BARU, KABUPATEN TANAH DATAR

ABSTRAK

Penelitian ini bertujuan mengkaji cadangan karbon organik tanah pada lahan pertanian intensif di Nagari Koto Baru, Kabupaten Tanah Datar pada 5 kelas lereng yang berbeda. Penelitian dilakukan dengan metode survei pada lereng 0-8%, 8-15%, 15-25%, 25-45%, dan >45%, dengan dua kedalaman tanah (0-30 cm dan 30-60 cm). Parameter yang dianalisis yaitu, C-organik, berat volume, total ruang pori, N-total, rasio C/N, dan emisi CO₂ tanah. Hasil penelitian menunjukkan bahwa kandungan C-organik berkisar antara 1,46%-2,96%, dan 0,39%-2,15%, Berat volume tanah (BV) berkisar antara 0,70-0,88 g/cm³ dan 0,80-1,00 g/cm³, total ruang pori (TRP) berkisar antara 66,30-72,83% dan 62,04-68,72%, N-total berkisar antara 0,17-0,23% dan 0,10-0,20%, rasio C/N antara 8,54-13,70 dan 0,10-10,54, masing-masing untuk kedalaman tanah 0-30 cm dan 30-60 cm. Sedangkan emisi CO₂ berkisar antara 45,12 -58,47 ton/ha/tahun pada permukaan tanah. Cadangan Karbon organik tanah menurun seiring bertambahnya kecuraman lereng. Pada lapisan atas (0-30 cm), cadangan karbon tertinggi (59,48 ton/ha) ditemukan pada lahan datar (0-8%), dan yang terendah (38,49 ton/ha) terdapat pada lereng sangat curam (>45%). Pada lapisan bawah (30-60 cm), cadangan tertinggi mencapai 54,71 ton/ha dan terendah 10,81 ton/ha. Korelasi negatif yang sangat kuat ditemukan antara cadangan karbon organik dan berat volume tanah ($r = -0,819$, $p < 0,01$), sementara korelasi positif signifikan ditemukan dengan total ruang pori ($r = 0,807$, $p < 0,01$), kandungan C-organik ($r = 0,949$, $p < 0,01$), nitrogen total ($r = 0,940$, $p < 0,01$), dan emisi CO₂ ($r = 0,883$, $p < 0,05$).

Kata kunci : Cadangan Karbon Organik Tanah, Lahan Pertanian Intensif, Lereng.

Study of Soil Organic Carbon Stocks Based on Slope in Intensive Agricultural Land Nagari Koto Baru, Tanah Datar Regency

ABSTRACT

This study was aimed to assess soil organic carbon stock on intensive agricultural land in Nagari Koto Baru, Tanah Datar Regency at 5 different slope classes. The research was conducted using survey method, the soil samples were taken based on slope levels (0-8%, 8-15%, 15-25%, 25-45%, and >45%), at two soil depth (0-30 cm and 30-60 cm). The parameters analyzed were organic-C, bulk density, total pore space, total nitrogen, C/N ratio, and soil CO₂ emission. The results showed that organic-C content ranged from 1.46%-2.96%, and from 0.39%-2.15%, soil bulk density (BD) ranged from 0.70-0.88 g/cm³ and 0.80-1.00 g/cm³, total pore space (TPS) ranged from 66.30-72.83% and 62.04-68.72%, total nitrogen ranged from 0.17-0.23% and 0.10-0.20%, C/N ratio ranged from 8.54-13.70 and 0.10-10.54, respectively for 0-30 cm and 30-60 cm soil depth. CO₂ emissions ranged from 45.12 -58.47 tons/ha/year on soil surface. Soil organic carbon stock decreased by increasing slope steepness. In the upper layer (0-30 cm), the highest carbon stock (54, 48 tons/ha) was found on flat land (0-8%) and the lowest (38, 49 tons/ha) on very steep slopes (>45%). In the lower layer (30-60 cm), the highest reached 54.71 tons/ha and the lowest 10.81 tons/ha. A very strong negative correlation was found between organic carbon stock and BD ($r = -0.819$, $p < 0.01$), while significant positive correlations were found with TPS ($r = 0.807$, $p < 0.01$), organic-C content ($r = 0.949$, $p < 0.01$), total nitrogen ($r = 0.940$, $p < 0.01$), and CO₂ emissions ($r = 0.883$, $p < 0.05$).

Keywords : Soil Organic Carbon Stock, Intensive Agriculture Land, Slope

