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Determinan dan Dampak Adopsi Sistem Integrasi Sapi-Kelapa Sawit (SISKA) terhadap Efisiensi Pengelolaan Usaha Sawit di Kabupaten Tanah Laut, Kalimantan Selatan
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DETERMINAN DAN DAMPAK ADOPSI SISTEM INTEGRASI SAPI-KELAPA SAWIT (SISKA) TERHADAP EFISIENSI PENGELOLAAN USAHA SAWIT DI KABUPATEN TANAH LAUT, KALIMANTAN SELATAN

INTISARI

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Sistem Integrasi Sapi-Kelapa Sawit (SISKA) merupakan salah satu pendekatan integrasi usaha perkebunan dan peternakan yang berpotensi meningkatkan efisiensi pengelolaan usaha sawit melalui pemanfaatan vegetasi bawah tegakan sebagai pakan ternak dan peran sapi sebagai agen pengendali gulma biologis. Penelitian ini bertujuan untuk: (1) mendeskripsikan karakteristik responden dan karakteristik usaha petani sawit di Kabupaten Tanah Laut; (2) menganalisis faktor-faktor yang memengaruhi keputusan petani sawit dalam mengadopsi SISKA; dan (3) menganalisis dampak adopsi SISKA terhadap efisiensi pengelolaan usaha sawit berdasarkan frekuensi penggunaan herbisida dan frekuensi pembersihan gulma. Penelitian dilaksanakan pada bulan Desember 2025 hingga Februari 2026 di Kabupaten Tanah Laut, Kalimantan Selatan, khususnya di Kecamatan Batu Ampar. Penelitian menggunakan pendekatan survei terhadap 179 petani sawit, terdiri dari 76 adopter SISKA dan 103 non-adopter SISKA. Data dianalisis menggunakan analisis deskriptif, regresi logistik biner, evaluasi propensity score matching berbasis Average Treatment Effect on the Treated (ATT), dan propensity score overlap weighting berbasis Average Treatment Effect in the Overlap Population (ATO). Hasil penelitian menunjukkan bahwa tingkat pendidikan, jumlah kepemilikan ternak, keikutsertaan dalam kelompok tani atau kelompok ternak, penyuluhan SISKA, dan pendapatan berpengaruh positif terhadap keputusan adopsi SISKA. Jumlah anggota keluarga dan luas kepemilikan lahan sawit berpengaruh negatif terhadap keputusan adopsi SISKA, sedangkan umur, pengalaman bertani sawit, dan pola kemitraan kebun tidak berpengaruh signifikan. Evaluasi PSM/ATT menunjukkan bahwa PSM tanpa caliper tidak menghasilkan keseimbangan kovariat yang memadai, sedangkan PSM dengan caliper 0,20 masih menyisakan kovariat tidak seimbang dan hanya mempertahankan sebagian kecil sampel. Oleh karena itu, analisis dampak menggunakan ATO/overlap weighting. Hasil estimasi ATO menunjukkan bahwa adopsi SISKA menurunkan frekuensi penggunaan herbisida sebesar 0,479 kali per hektar per siklus dan frekuensi pembersihan gulma sebesar 0,558 kali per hektar per siklus. Dengan demikian, adopsi SISKA berkontribusi terhadap efisiensi pengelolaan gulma pada usaha sawit rakyat melalui pemanfaatan sapi sebagai biological weeding agent.

Kata kunci: Adopsi, ATO, Efisiensi, *Overlap weighting*, SISKA

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DETERMINANTS AND IMPACTS OF THE ADOPTION OF THE CATTLE-OIL PALM INTEGRATION SYSTEM (SISKA) ON THE EFFICIENCY OF OIL PALM FARM MANAGEMENT IN TANAH LAUT REGENCY, SOUTH KALIMANTAN

ABSTRACT

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The Cattle-Oil Palm Integration System (SISKA) is an integrated farming approach that combines plantation and livestock enterprises and has the potential to improve the efficiency of oil palm farm management through the utilisation of understorey vegetation as cattle feed and the role of cattle as biological weeding agents. This study aimed to: (1) describe the characteristics of respondents and oil palm farming enterprises in Tanah Laut Regency; (2) analyse the factors influencing oil palm farmers' decisions to adopt SISKA; and (3) analyse the impact of SISKA adoption on the efficiency of oil palm farm management based on the frequency of herbicide use and the frequency of weed clearing. The study was conducted from December 2025 to February 2026 in Tanah Laut Regency, South Kalimantan, specifically in Batu Ampar Districts. A survey approach was used involving 179 oil palm farmers, consisting of 76 SISKA adopters and 103 SISKA non-adopters. The data were analysed using descriptive analysis, binary logistic regression, evaluation of propensity score matching based on the Average Treatment Effect on the Treated (ATT), and propensity score overlap weighting based on the Average Treatment Effect in the Overlap Population (ATO). The results showed that education level, number of cattle owned, membership in farmer or livestock groups, exposure to SISKA extension services, and income had positive effects on SISKA adoption decisions. Family size and oil palm land ownership had negative effects on SISKA adoption decisions, while age, oil palm farming experience, and plantation partnership pattern had no significant effect. The PSM/ATT evaluation showed that PSM without caliper did not produce adequate covariate balance, while PSM with a 0.20 caliper still left several covariates unbalanced and retained only a small proportion of the sample. Therefore, the impact analysis used ATO-based overlap weighting. The ATO estimation results showed that SISKA adoption reduced herbicide-use frequency by 0.479 applications per hectare per cycle and reduced weed-clearing frequency by 0.558 activities per hectare per cycle. Thus, SISKA adoption contributes to weed management efficiency in smallholder oil palm farming through the use of cattle as biological weeding agents.

Keywords: Adoption, ATO, Efficiency, Overlap weighting, SISKA.