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Implementasi Pendekatan Geospatial Intelligence dalam Patroli Pengamanan Perbatasan Negara Republik Indonesia-Malaysia Wilayah Nunukan Kalimantan Utara = Implementation of the Geospatial Intelligence Approach in the Patrol of the Border Security of the Republic of Indonesia-Malaysia in the Nunukan Region of North Kalimantan

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Abstrak

Perbatasan negara juga merupakan boundary dan frontier, yang memiliki nilai strategis bagi kedaulatan negara. Pengelolaan perbatasan negara harus didukung oleh ketahanan nasional yang tangguh untuk menghadapi ancaman, tantangan, hambatan dan gangguan dalam rangka mencapai tujuan nasional. Salah satu bentuk dukungan nyata berupa patroli pengamanan perbatasan negara secara intensif. Oleh karena itu, dibutuhkan perencanaan yang efektif dalam meminimalisir hambatan dan gangguan di lapangan. Sistem Informasi Geografis memberikan solusi fungsi analisis medan secara otomatis. Analisis medan mampu menilai tingkat risiko patroli pengamanan berdasarkan kriteria geografi militer (ancaman musuh, cuaca ekstrem, medan terjal, lost sinyal komunikasi, akses jalan yang sulit, vegetasi yang rapat, sungai yang dalam) Penelitian ini menggunakan model Applied Research yang bersifat kualitatif dan kuantitatif (mixed method). Penilaian awal terhadap perbandingan 3 pendekatan intelijen (GeoInt, Humint, dan Osint) bersifat kualitatif dengan metode Analytical Hierarchy Process (AHP). Pengumpulan data melalui kuesioner terhadap 33 prajurit TNI AD dengan kriteria tertentu. Adapun, implementasi Geospatial Intelligence untuk memperkirakan rute patroli bersifat kualitatif dengan metode Spatial Multi Criteria Evaluation (SMCE). Sumber data berasal dari geodatabase milik BIG (Demnas, Data vektor sungai), DITTOPAD (Peta Topografi 1:50.000), Kementan (Data vektor jenis tanah) dan ESA (Citra Satelit Sentinel-2A). Hasil penelitian menunjukkan tingkat risiko tertinggi merupakan ancaman musuh dengan persentase 44,1 % dan terendah karena adanya hambatan vegetasi yang rapat dengan persentase 7,2 %. Penelitian ini juga menghasilkan Peta Rekomendasi Rute Patroli yang memiliki tingkat risiko yang rendah berdasarkan klasifikasi standar NATO (Go, Slow Go, dan No Go). Penelitian ini memberikan kontribusi nyata untuk mendukung Ketahanan Nasional yang tangguh, terutama dalam hal perencanaan patroli pengamanan perbatasan negara Republik Indonesia-Malaysia.

.....National borders are also boundaries and frontiers, which have strategic value for the country's sovereignty. A robust national resilience must support national borders' management to face threats, challenges, obstacles, and disturbances to achieve national goals. One form of tangible support is in the form of intensive

patrols to secure state borders. Therefore, effective planning is needed to minimize obstacles and disturbances in the field. Geographical Information System provides solutions for automatic terrain analysis functions. Field analysis can assess the level of risk of security patrols based on military geographic criteria (enemy threats, extreme weather, steep terrain, lost communication signals, difficult road access, dense vegetation, deep rivers). This study uses an Applied Research model that is qualitative and quantitative (mixed method). The initial assessment of the comparison of 3 intelligence approaches (GeoInt, Humint, and Osint) is qualitative with the Analytical Hierarchy Process (AHP) method. Data collection through questionnaires to 33 TNI AD soldiers with specific criteria. Meanwhile, Geospatial Intelligence's implementation to estimate patrol routes is qualitative using the Spatial Multi-Criteria Evaluation (SMCE) method. Sources of data come from the geodatabase belonging to BIG (Demnas, River vector data), DITTOPAD (Topographic Map 1: 50,000), Ministry of Agriculture (Land type vector data), and ESA (Sentinel-2A Satellite Imagery). The results showed that the highest level of risk was an enemy threat with a percentage of 44.1%, and the lowest was due to dense vegetation barriers with a percentage of 7.2%. This research also produced a Patrol Route Recommendation Map, which has a low-risk level based on the standard NATO classification (Go, Slow Go, and No Go). This research makes a real contribution to support a formidable National Resilience, especially in planning the Republic of Indonesia-Malaysia's border patrols