PEMETAAN ZONA KERENTANAN GERAKAN TANAH MENGGUNAKAN KOMBINASI METODE *FREQUENCY RATIO* DAN *LOGISTIC REGRESSION* DI KABUPATEN ACEH BARAT PROVINSI ACEH

SKRIPSI

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ABSTRAK

PEMETAAN ZONA KERENTANAN GERAKAN TANAH MENGGUNAKAN KOMBINASI METODE *FREQUENCY RATIO* DAN *LOGISTIC REGRESSION* DI KABUPATEN ACEH BARAT PROVINSI ACEH

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Kabupaten Aceh Barat termasuk salah satu kabupaten di Provinsi Aceh yang memiliki kerawanan tinggi terhadap gerakan tanah. Hal ini dipengaruhi oleh kondisi topografi, geologi, serta curah hujan yang kompleks dan berpotensi memicu kestabilan lereng, sehingga diperlukan penelitian yang intensif. Penelitian ini bertujuan untuk memetakan zona kerentanan gerakan tanah di kabupaten tersebut. Pemetaan ini dilakukan dengan menerapkan kombinasi Metode *Frequency Ratio* (FR) dan *Logistic Regression* (LR) berdasarkan 13 faktor pemicu. Faktor tersebut meliputi elevasi, kemiringan lereng (*Slope*), aspek lereng, *profile curvature¸ plan curvature*, tata guna lahan, jarak dari sungai, jarak dari jalan, jenis tanah, litologi, *Normalized Difference Vegetation Index* (NDVI), *Peak Ground Acceleration* (PGA), dan curah hujan. Sebanyak 448 titik gerakan tanah digunakan sebagai data inventaris yang dibagi menjadi data pelatihan (*success rate*) sebanyak 80% dan data validasi (*prediction rate*) sebanyak 20%. Evaluasi model dilakukan menggunakan kurva *Receiver Operating Characteristic* (ROC) berdasarkan nilai *Area Under Curve* (AUC). Nilai AUC menunjukkan seberapa baik model mampu memprediksi terjadinya gerakan tanah. Model kombinasi FR – LR menunjukkan hasil yang lebih baik dibandingkan model FR secara tunggal. Metode kombinasi FR – LR menghasilkan nilai AUC sebesar 0,871 (*success rate*) dan 0,883 (*prediction rate*), sedangkan Metode FR menghasilkan nilai AUC sebesar 0,859 (*success rate*) dan 0,868 (*prediction rate*). Temuan ini menunjukkan bahwa kombinasi Metode FR – LR lebih efektif dalam meningkatkan akurasi serta memodelkan dan memprediksi kerentanan gerakan tanah dibandingkan Metode FR saja. Penelitian ini dapat menjadi acuan awal dalam pengembangan kajian mitigasi bencana gerakan tanah mengingat belum banyak penelitian sejenis yang dilakukan di wilayah ini.

Kata Kunci : kerentanan gerakan tanah, *frequency ratio*, *logistic regression*, kabupaten aceh barat

ABSTRACT

LANDSLIDE SUSCEPTIBILITY MAPPING USING A COMBINATION OF FREQUENCY RATIO AND LOGISTIC REGRESSION METHODS IN WEST ACEH REGENCY ACEH PROVINCE

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West Aceh Regency is one of the regencies in Aceh Province that has a high susceptibility to landslides. This is influenced by complex topographical, geological, and rainfall conditions that can trigger Slope instability, so intensive research is needed. This study aims to map landslide susceptibility zones in the regency. This mapping was conducted by applying a combination of the Frequency Ratio (FR) and Logistic Regression (LR) methods based on 13 triggering factors. These factors include elevation, slope, aspect, profile curvature, plan curvature, land use, distance from rivers, distance from roads, soil type, lithology, Normalized Difference Vegetation Index (NDVI), Peak Ground Acceleration (PGA), and rainfall. A total of 448 landslide points were used as inventory data divided into training data (success rate) of 80% and validation data (prediction rate) of 20%. Model performance was evaluated using the Receiver Operating Characteristic (ROC) Curve based on the Area Under Curve (AUC) value. The AUC value indicates how well the model is able to predict landslide occurrence. The combined FR-LR model showed better results than the single FR model. The combined FR-LR method produced AUC values of 0.871 (success rate) and 0.883 (prediction rate), while the FR method produced AUC values of 0.859 (success rate) and 0.868 (prediction rate). These findings indicate that the FR–LR combination is more effective in modeling and predicting landslide susceptibility. This study is expected to serve as an initial reference for the development of landslide disaster mitigation, especially since similar studies are still limited in this region.

Keyword : landslide susceptibility, frequency ratio, logistic regression, west aceh regency

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