SARI

Rencana Jalan Ayah-Jladri di Kabupaten Kebumen dibangun sebagai alternatif dan solusi tentang permasalahan yang terjadi pada jalan utama yang menghubungkan Ayah-Jladri. Permasalahan tersebut adalah kondisi tikungan yang tidak memenuhi syarat, jalan utama sudah banyak pemukiman sehingga menyulitkan untuk pembebasan tanah dan pelebaran, dan termasuk kedalam daerah rawan gerakan tanah. Tujuan dari penelitian ini adalah mengetahui kondisi geologi teknik (geomorfologi, tanah dan batuan, struktur geologi dan air tanah) di lokasi penelitian dan mengevaluasi kerentanan gerakan tanah dengan parameter sesuai SNI 2016 (kemiringan lereng, jenis batuan, jarak dari struktur geologi, dan tata guna lahan). Metode penelitian dilakukan dengan pemetaan geologi teknik skala 1:25.000 dan analisis kerentanan gerakan tanah skala 1:25.000 yang dilakukan dengan metode statistik semi-kualitatif *Analytical Hierarchy Process* (AHP).

Daerah penelitian memiliki satuan geomorfologi berupa perbukitan sisa gunung api, perbukitan karst, bukit intrusi, dan dataran aluvial. Satuan geologi di daerah penelitian berupa lava andesit, breksi andesit, intrusi andesit, batugamping, dan pasir. Berdasarkan tingkat pelapukan batuan, daerah penelitian tersusun atas lava andesit lapuk rendah, lava andesit lapuk sedang, lava andesit lapuk tinggi, batugamping lapuk rendah, batugamping lapuk sedang, intrusi andesit lapuk sedang, dan breksi andesit lapuk rendah. Daerah penelitian juga terdiri dari lima satuan geologi teknik kualitas massa batuan GSI, yaitu kualitas massa batuan sangat baik (GSI 76-95), baik (GSI 56-75), sedang (GSI 41-55), buruk (GSI 21-40), dan sangat buruk (GSI <20). Struktur geologi yang terdapat pada lokasi penelitian berupa kekar dan sesar geser dekstral dengan orientasi barat laut-tenggara. Air tanah memiliki kedalaman 2-5 m, sehingga perlu perlakuan khusus pada lokasi pembangunan jalan.

Berdasarkan hasil analisis dengan metode AHP, didapatkan bobot parameter kemiringan lereng (46,6%), litologi (27,7%), jarak dari struktur (16,1%), dan tataguna lahan (9,6%). Daerah penelitian dikelompokkan ke dalam 4 tingkat kerentanan gerakan tanah, yaitu zona kerentanan gerakan tanah sangat rendah (3,13%), zona kerentanan gerakan tanah rendah (9,23%), zona kerentanan gerakan tanah sedang (53,51%), dan zona kerentanan gerakan tanah tinggi (34,13%). Daerah penelitian dominan zona kerentanan gerakan tanah sedang dan terdapat 10 kejadian gerakan tanah di sekitar trase jalan. Dilakukan validasi menggunakan kurva rasio frekuensi dengan hasil linier dan kurva ROC dengan hasil 0,803 (baik).

Kata Kunci : Jalan Ayah-Jladri, Karakteristik geologi teknik, kerentanan gerakan tanah, *Geological Strength Index*, *Analytical Hierarchy Process.*

Abstract

The Ayah-Jladri Road Plan in Kebumen Regency was built as an alternative and solution to the problems that occur on the main road connected to Ayah-Jladri. The problem is because the bend conditions are not in accordance with the requirements, the main road has many settlements, making it difficult for land acquisition and road widening, and is included in landslide prone areas. The purpose of this study is to determine the characteristics of engineering geology (geomorphology, soil and rock, geological structure and groundwater) at the research site and evaluate the landslide susceptibility using parameters according to the SNI 2016 (slope, rock type, distance from geological structure, and land use). The research methods are carried out using a 1:25.000 scale engineering geological mapping and and a 1:25.000 scale landslide susceptibility analysis carried out using a semi-qualitative statistical method Analytical Hierarchy Process (AHP).

The research area has geomorphological units in the form of volcanic remnant hills, karst hills, intrusion hills, and alluvial plains. The geological units in the study area are andesite lava, andesite breccia, andesite intrusion, limestone, and sands. Based on the level of rock weathering, the study area is composed of units of low weathered andesite lava, medium weathered andesite lava, high weathered andesite lava, low weathered limestone, moderate weathered limestone, moderate weathered andesite intrusion, and low weathered andesite breccia. The research area also consists of five engineering geological units of GSI rock mass quality, very good rock mass quality (GSI 76-95), good (GSI 56-75), moderate (GSI 41-55), poor (GSI 21-40), and very bad (GSI < 20). The geological structure found at the research location is in the form of joints and dextral shear faults with a northwest-southeast orientation. Groundwater has a depth of 2-5 m, so it needs special treatment at the road construction site.

Based on the results of the analysis using the AHP method, the weight of the slope parameters (46.6%), lithology (27.7%), distance from the structure (16.1%), and land use (9 ,6%). The research area is grouped into 4 levels of landslide susceptibility, the very low landslide susceptibility zone (3.13%), the low landslide suscepbility zone (9,23%) the medium landslide susceptibility zone (53.51%), and the high landslide susceptibility zone (34.13%). The dominant research area is a moderate landslide susceptibility zone and there are 10 occurrences of soil movement around the road alignment. Validation was carried out using the frequency ratio curve with linear results and the ROC curve with 0.803 (good) results.

***Keywords**: Ayah-Jladri Road, Characteristics of engineering geology, Landslides susceptibility, Geological Strength Index, Analytical Hierarchy Process.*