

SARI

Bendungan Jragung merupakan bendungan yang berada di Kabupaten Semarang, Provinsi Jawa Tengah dan masih dalam tahap pembangunan. Tujuan utama dibangunnya Bendungan Jragung adalah untuk kepentingan irigasi, pengendalian banjir, sebagai pembangkit listrik, dan pemenuhan kebutuhan air di daerah sekitarnya. Salah satu bahaya geologi yang mungkin terjadi berkaitan dengan bendungan adalah gerakan tanah pada lereng area genangan bendungan. Tujuan dari penelitian ini adalah untuk mengetahui kondisi geologi teknik daerah penelitian serta mengetahui zona kerentanan gerakan tanah dengan parameter sesuai SNI 8291:2016. Penelitian dilakukan dengan pemetaan geologi teknik skala 1:25.000, pengujian sifat keteknikan pada sampel batuan, dan analisis kerentanan gerakan tanah skala 1:25.000 dengan metode semi-kualitatif atau semi-kuantitatif *Analytical Hierarchy Process* (AHP) yang menggunakan rasio frekuensi serta kurva *Receiver Operating Characteristic* (ROC) sebagai validasi.

Hasil penelitian menunjukkan daerah penelitian memiliki tiga satuan geomorfologi, yaitu dataran banjir berlereng landai – miring, perbukitan denudasional berlereng landai, dan perbukitan lipatan berlereng agak curam – curam. Daerah penelitian tersusun oleh empat satuan batuan, yaitu batulempung karbonatan, batupasir karbonatan, batulanau karbonatan, dan breksi vulkanik. Berdasarkan tingkat pelapukan batuan, daerah penelitian tersusun oleh enam satuan, yaitu batulempung karbonatan lapuk sedang, batulempung karbonatan lapuk tinggi, batupasir karbonatan lapuk sedang, batupasir karbonatan lapuk tinggi, batulanau karbonatan lapuk sedang, dan batulanau karbonatan lapuk tinggi. Kualitas massa batuan berdasarkan klasifikasi *Geological Strength Index* (GSI) dibagi menjadi dua, yaitu GSI dengan rentang nilai 20 – 30 dan 30 – 40. Struktur geologi yang terdapat pada daerah penelitian berupa kekar gerus, sesar naik minor, sesar geser dekstral minor, dan lipatan yang terdiri dari tiga sinklin dan dua antiklin. Kemudian muka air tanah berada pada kedalaman 1 – 35 meter dengan ketinggian 45 – 120 mdpl.

Analisis metode AHP dilakukan dengan tiga variasi dan dipilih variasi 2 sebagai model yang digunakan. Daerah penelitian dikelompokkan kedalam empat tingkat kerentanan gerakan tanah, yaitu zona kerentanan sangat rendah (33,19%), zona kerentanan rendah (35,68%), zona kerentanan menengah (23,07%), dan zona kerentanan tinggi (8,06%). Validasi menggunakan rasio frekuensi menghasilkan nilai yang linier dan kurva ROC dengan hasil 0,802 (baik).

Kata Kunci: area genangan Bendungan Jragung, kondisi geologi teknik, kerentanan gerakan tanah, *Analytical Hierarchy Process* (AHP)

ABSTRACT

Jragung Dam is located in Semarang Regency, Central Java and is still under construction. The main purpose of the construction of the Jragung Dam is for irrigation, flood control, as a power plant, and to fulfill water needs in the surrounding area. One of the geological hazards that may occur related with the dam is the ground movement on the slopes of the dam reservoir area. The purpose of this study is to determine the characteristic of engineering geology of the research area and determine the landslide susceptibility using parameters according to the SNI 8291:2016. The research methods area carried out by conducting engineering geological mapping on a scale of 1:25.000, laboratory testing of the engineering properties on rock samples, and analyzing the ground movement susceptibility on a scale of 1:25.000 using the semi-qualitative or semi-quantitative method Analytical Hierarchy Process (AHP) using frequency ratio and Receiver Operating Characteristic (ROC) curve as a validation.

The result of the study showed that the research area has three geomorphological units, namely gently slope-sloping floodplains, gently slope denudational hills, moderately steep-steep folding hills. The study area is composed of four rock units, namely carbonaceous claystone, carbonaceous sandstone, carbonaceous siltstone, and volcanic breccia. Based on the level of rock weathering, the study area is composed of six units, namely moderately weathered carbonaceous claystone, highly weathered carbonaceous claystone, moderately weathered carbonaceous sandstone, highly weathered carbonaceous sandstone, moderately weathered carbonaceous siltstone, and highly weathered carbonaceous siltstone. The rock mass quality based on Geological Strength Index (GSI) Classification is divided into two, GSI with a value range of 20-30 and 30-40. The geological structure found at the research area are shear joint, minor reverse fault, minor dextral strike-slip fault, and folds consisting of three synclines and two anticlines. The condition of the groundwater level is at a depth of 1-35 meters with an altitude of 45-120 meters above sea level.

Analysis of the AHP method was carried out with three variations and variation 2 was chosen as the model used. The study area is grouped into four levels of ground movement susceptibility, namely the very low ground movement susceptibility zone (33,19%), the low ground movement susceptibility zone (35,68%), the medium ground movement susceptibility zone (23,07%), and the high ground movement susceptibility zone (8,06%). Validation using the frequency ratio produces in a linear value and the ROC curve with a result of 0,802 (good).

Keywords: *reservoir area of Jragung Dam, engineering geological condition, ground movement susceptibility, Analytical Hierarchy Process (AHP)*