

## SARI

Peningkatan jumlah wisatawan di Kawasan Wisata Lereng Gunung Merapi bagian Utara dan Merbabu bagian Selatan, Kecamatan Selo, Kabupaten Boyolali menuntut adanya pengembangan kawasan wisata tersebut, baik berupa perbaikan fasilitas tempat wisata yang sudah ada, pembangunan tempat wisata baru, dan peningkatan layanan pendukung lainnya. Pengembangan kawasan wisata harus mempertimbangkan aspek kemampuan geologi teknik kawasan wisata tersebut untuk menjamin keberlangsungan konstruksi dan mencegah adanya kehilangan nyawa serta kerugian harta. Informasi kondisi geologi teknik di wilayah Kabupaten Boyolali khususnya kawasan wisata di Kecamatan Selo sampai saat ini belum tersedia. Tujuan penelitian ini adalah untuk mendapatkan informasi terkait karakteristik geologi dan geologi teknik daerah penelitian serta menganalisis dan membuat peta zona kemampuan geologi teknik daerah penelitian skala 1:25.000. Metode penelitian yang digunakan berupa pemetaan geologi teknik skala 1:25.000, penilaian sifat keteknikan batuan dan tanah, analisis laboratorium, analisis kerentanan bencana geologi, geomorfologi, dan pengukuran kedalaman muka airtanah. Hasil penelitian menunjukkan bahwa morfologi daerah penelitian tersusun oleh satuan lereng gunungapi terbuku sedang, satuan lereng gunungapi bergelombang, dan satuan lembah gunungapi curam dengan kemiringan lereng bervariasi mulai dari sangat rendah ( $0^{\circ}$ - $8^{\circ}$ ), rendah ( $8^{\circ}$ - $30^{\circ}$ ), dan menengah ( $30^{\circ}$ - $70^{\circ}$ ). Satuan geologi teknik daerah penelitian tersusun oleh satuan breksi andesit, satuan andesit lava, satuan breksi tuf, dan satuan tuf lapilli dengan tingkat pelapukan sedang hingga sangat tinggi serta kualitas massa batuan permukaan GSI berkisar antara *good* hingga *very poor*. Struktur geologi pada daerah penelitian berupa kekar dan kedalaman muka airtanah masuk pada kategori dalam ( $>3\text{m}$ ). Daya dukung batuan dan tanah pada daerah penelitian berupa batuan dengan kapasitas daya dukung sebesar 294 kPa - 4.316 kPa serta kemudahan penggalian termasuk kategori mudah hingga sangat sukar untuk digali. Berdasarkan hasil pembobotan, perhitungan, dan analisis menggunakan metode AHP, zona kemampuan geologi teknik daerah penelitian dapat dibedakan menjadi tiga zona, yaitu zona kemampuan geologi teknik tinggi, sedang, dan rendah. Kerentanan bencana geologi menjadi parameter yang memberikan pengaruh signifikan dalam pembagian zona kemampuan geologi teknik pada daerah penelitian. Lokasi terbaik yang direkomendasikan untuk pengembangan kawasan wisata pada daerah penelitian yaitu pada zona kemampuan geologi teknik tinggi.

**Kata Kunci :** pengembangan kawasan wisata, karakteristik geologi teknik, tingkat pelapukan, kualitas massa batuan, zona kemampuan geologi teknik.

## ABSTRACT

*The increasing number of tourists in the Northern Slopes of Mount Merapi and Southern Slopes of Mount Merbabu Tourism Areas, Selo District, Boyolali Regency demands the development of these tourist areas, in the form of improving existing tourist attraction facilities, building new tourist attractions, and improving other supporting services. The development of tourist areas must consider the engineering geological capabilities of the tourist area to ensure the continuity of construction and prevent loss of life and property. Information on engineering geological conditions in the Boyolali Regency area, especially the tourist area in Selo District, is not yet available. The aim of this research is to obtain information related to the geological and engineering geological characteristics of the research area as well as to analyze and create a 1:25,000 scale engineering geology capability zone map of the research area. The research methods used are engineering geological mapping at a scale of 1:25,000, assessment of the engineering properties of rocks and soil, laboratory analysis, geological disaster vulnerability analysis, geomorphology, and measurement of the depth of the groundwater level. The results of the research show that the morphology of the study area is composed of medium structured volcanic slope unit, wavy volcanic slope units, and steep volcanic valley units with varying slopes ranging from very low ( $0^{\circ}$ - $8^{\circ}$ ), low ( $8^{\circ}$ - $30^{\circ}$ ), and medium ( $30^{\circ}$ - $70^{\circ}$ ). The engineering geology units in the research area are composed of andesite breccia units, andesite lava units, tuff breccia units, and lapilli tuff units with medium to very high levels of weathering and the quality of the GSI surface rock mass ranges from good to very poor. The geological structure in the study area is joint and the depth of the groundwater table is in the deep category ( $> 3\text{m}$ ). The carrying capacity of rocks and soil in the research area is rock with a carrying capacity of  $294\text{ kPa} - 4.316\text{ kPa}$  as well as the ease of digging is in the category of easy to very difficult to excavate. Based on the results of weighting, calculations and analysis using the AHP method, the engineering geological capability zone of the research area can be divided into three zones, namely the high, medium and low engineering geological capability zone. Susceptibility to geological disasters is a parameter that has a significant influence on the division of engineering geology capability zones in the research area. The best location recommended for the development of tourist areas in the research area is in the zone of high engineering geological capability.*

**Keywords:** *tourist area development, engineering geology characteristics, weathering level, rock mass quality, engineering geology capability zone.*