

PERUBAHAN MORFOLOGI DAN ESTIMASI KERUGIAN FINANSIAL SEBUAH LONGSOR AKTIF MENGGUNAKAN DATA ORTHOPHOTO UNMANNED AERIAL VEHICLE (UAV)

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ABSTRAK

Penelitian terkait perubahan morfologi beserta risiko pada longsor aktif masih memerlukan kajian-kajian yang lebih detail. Longsor aktif berpotensi mengalami pergerakan. Identifikasi perubahan morfologi longsor perlu dilakukan agar tidak menyebabkan kerugian lanjutan secara finansial. Penelitian ini bertujuan untuk mengidentifikasi perubahan morfologi dan menilai potensi kerugian finansial yang dapat disebabkan oleh potensi pergerakan (*displacement*) longsor Manglong.

Tahapan penelitian terdiri dari identifikasi morfologi longsor, penilaian potensi pergerakan longsor, estimasi area longsor yang berpotensi mengalami pergerakan, identifikasi elemen terdampak dan estimasi nilai kerugian finansial berbasis interpretasi orthophoto UAV dan DTM. Foto udara dari UAV diolah menjadi orthophoto. Orthophoto selanjutnya diolah menjadi DSM dan DTM. Morfologi longsor, potensi pergerakan dan inventarisasi jenis tanaman diidentifikasi melalui interpretasi orthophoto secara visual yang dilengkapi dengan identifikasi lapangan. Penilaian potensi pergerakan longsor dilakukan dengan menggunakan orthophoto dua tahun yang berbeda (2019 dan 2021). Area longsor yang berpotensi mengalami pergerakan diukur menggunakan estimasi nilai sudut lereng stabil berdasarkan kenampakan penampang melintang longsor. Potensi kerugian finansial dampak pergerakan longsor dihitung berdasarkan nilai produksi, harga dan biaya pengelolaan.

Morfologi longsor Manglong secara umum terdiri dari bagian mahkota, gawir, kepala, badan, dan kaki longsor. Tipologi longsor adalah tipe translasi. Perubahan morfologi longsor menunjukkan bahwa terjadi pergerakan pada longsor Manglong dengan tipe *retrogressive*. Pergerakan paling besar terjadi pada bagian mahkota longsor. Area di bagian mahkota longsor yang berpotensi mengalami pergerakan adalah seluas 0,6 Ha dengan kelas penutup lahan berupa kebun campuran. Kerugian finansial yang dapat disebabkan oleh potensi pergerakan longsor Manglong adalah sebesar Rp.51.906.000. Jumlah kerugian yang dihasilkan tidak berpengaruh signifikan terhadap perekonomian Kabupaten Magelang.

Kata kunci: longsor aktif, foto udara, pergerakan longsor, sudut stabil, elemen terdampak, kerugian finansial

***MORPHOLOGICAL CHANGES AND FINANCIAL LOSS ESTIMATION
OF AN ACTIVE LANDSLIDES USING UNMANNED AERIAL VEHICLE
(UAV) ORTHOPHOTO DATA***

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ABSTRACT

Research related to morphological changes along with the risk of active landslides still requires more detailed studies. Active landslides have the potential to experience displacement. Identification of landslide morphological changes needs to be done so as not to cause further financial losses. This study aims to identify morphological changes and assess the potential financial losses that can be caused by the potential displacement of the Manglong landslide.

The research stages consist of identification of landslide morphology, assessment of potential landslide displacement, estimation of landslide area that has the potential to experience displacement, identification of affected elements and estimation of the value of financial losses based on interpretation of UAV orthophoto and DTM. Aerial photos of the UAV are processed into orthophotos. The orthophotos are then processed into DSM and DTM. Landslide morphology, potential of displacement, and plant species inventory were identified through visual orthophoto interpretation complemented by field identification. Assessment of potential landslide displacement was carried out using orthophotos of two different years (2019 and 2021). The landslide area that has the potential to experience displacement is measured using an estimated slope stability angle value based on the cross-sectional appearance of the landslide. Potential financial losses due to landslides are calculated based on production value, price and management costs.

The morphology of the Manglong landslide generally consists of the crown, escarpment, head, body and foot of the landslide. The typology of the landslide belongs to translational type. The change in landslide morphology indicates that there is displacement in Manglong landslide with a retrogressive type. The largest displacement occurred in the crown of the landslide. The area in the crown of the landslide that has the potential to experience displacement is 0.6 ha with land cover class of mixed gardens. The financial loss that can be caused by the potential of Manglong landslide displacement is Rp.51.906.000. The amount of losses generated does not give significant effect on the economy of Magelang Regency.

Keywords: *active landslides, aerial photo, landslide displacement, slope stability angle, affected elements, financial loss*