

## INTISARI

### **INTEGRASI METODE *UAV STRUCTURE FROM MOTION* FOTOGAMETRI DAN SEISMIK REFRAKSI UNTUK IDENTIFIKASI POTENSI LONGSOR LOKAL DI KELURAHAN BANJARSARI, KECAMATAN SAMIGALUH, KABUPATEN KULON PROGO, DAERAH ISTIMEWA YOGYAKARTA**

Oleh

Dipta Eka Satria  
18/427548/PA/18508

Salah satu kecamatan di Kabupaten Kulon Progo yaitu Samigaluh, merupakan kecamatan dengan tingkat kerawanan longsor dengan jumlah sebanyak 29 kejadian selama tahun 2020 dimana kemiringan lereng yang sangat curam menjadi faktor utamanya. Oleh karena itu, perlu dilakukan investigasi kondisi geomorfologi dan bidang gelincir pada area tersebut dengan mengintegrasikan metode *UAV Structure from Motion* Fotogrametri dan metode seismik refraksi gelombang sekunder horizontal (*SH-wave*).

Pemetaan kondisi geomorfologi dilakukan dengan menggunakan *UAV/drone* yang diterbangkan disekitar area penelitian pada ketinggian 120 meter dan mengambil foto 2D yang saling tumpang tindih. Akuisisi data Seismik Refraksi gelombang sekunder horizontal (*SH-wave*) dilakukan pada 2 lintasan di dekat lokasi bekas longsor dengan *geophone* yang digunakan sebanyak 24 ditancapkan horizontal pada spasi 2 meter. Data *UAV/Drone* diolah menggunakan *software* Agisoft untuk didapat data *Orthomosaic* dan *Digital Surface Model* (DSM). Data *Digital Surface Model* (DSM) kemudian dikonversi ke *Digital Terrain Model* (DTM) menggunakan *software* PCI Geomatica dan QGIS. Data seismik refraksi diolah menggunakan *software* Pickwin dan Plotrefa untuk didapat model 2D 2 perlapisan kecepatan gelombang sekunder bawah permukaan.

Hasil dari pengolahan data *UAV/Drone* didapatkan persentase lereng yang curam sebesar 49,1% dari luas area penelitian 64.958 m<sup>2</sup>. Hasil dari pengolahan data seismik refraksi didapati ketebalan lapisan lapuk 1,02 – 4,17 meter yang menebal dari arah tenggara ke barat laut dengan geometri bidang gelincir yaitu *translational*, berdasarkan analisis nilai kecepatan rata-rata gelombang sekunder ( $V_{S30}$ ) dapat diketahui bahwa daerah di sebelah barat laut lintasan lebih rawan longsor daripada di sebelah tenggara lintasan.

**Kata Kunci:** *UAV/drone*, seismik refraksi, *SH-wave*, longsor, Kulon Progo

## ABSTRACT

***INTEGRATION OF UAV STRUCTURE FROM MOTION  
PHOTOGRAMETRY AND SEISMIC REFRACTION METHOD FOR  
IDENTIFICATION OF LOCAL LANDSLIDE HAZARD IN BANJARSARI  
VILLAGE, SAMIGALUH DISTRICT, KULON PROGO REGENCY, SPECIAL  
REGION OF YOGYAKARTA***

By

Dipta Eka Satria  
18/427548/PA/18508

Samigaluh District is an area in Special Region of Yogyakarta Province that prones toward landslide with 29 events in 2020 where the very steep slope is the main factor. Therefore, investigation of slope geomorphology and failure plane can be conducted by integrating UAV Structure from Motion (SfM) photogrammetry and refraction seismic horizontal secondary wave (SH-wave) methods.

Mapping of slope geomorphology had been conducted by using UAV/drone that flew at altitude of 120 meters and captured overlapped 2D images. While, for the seismic data acquisition, we used horizontal secondary wave (SH-wave) by installing 24 geophones horizontally with spacing of 2 meters. UAV/Drone data is processed using Agisoft software to obtain Orthomosaic and Digital Surface Model (DSM) data. The Digital Surface Model (DSM) data was then converted to Digital Terrain Model (DTM) and slope map by using PCI Geomatica and QGIS software. Seismic refraction data were processed using Pickwin and Plotrefa software to obtain a layered 2D  $V_s$  models.

The results slope map shows that the area is dominated by steep slope with 49.1% of the 64,958 m<sup>2</sup> study area and may indicate a high hazardous of landslide area based on geomorphology. The results of the seismic refraction data processing found that the thickness of the soil layer is 1.02 – 4.17 meters which thickens from the southeast to the northwest with a translational landslide geometry, based on the analysis of the average secondary wave velocity ( $V_{s30}$ ) it was found that northwest side is more susceptible to landslides than southeast side.

**Keywords:** UAV/drone, seismic refraction, SH-wave, landslide, Kulon Progo