

**STUDI POTENSI LONGSOR BERDASARKAN GEOMETRI DARI DATA
GROUND PENETRATING RADAR (GPR) DAN SISTEM INFORMASI
GEOGRAFIS DI DAERAH KARANGTENGAH, IMOIRI, BANTUL, D.I.
YOGYAKARTA**

Catherine Monalisa Panggabean¹⁾

¹⁾Teknik Geofisika UPN “Veteran” Yogyakarta

ABSTRAK

Tanah longsor merupakan salah satu bentuk hasil gerakan massa (*mass movement*) di sepanjang bidang gelincirnya. Bencana tanah longsor ini sering terjadi di wilayah Imogiri, Bantul karena lebih dari 50% wilayah Kabupaten Bantul merupakan wilayah yang rawan terhadap gerakan tanah. Studi GPR dilakukan untuk menganalisis lapisan lapuk dan geometri bidang gelincir serta studi berbasis Sistem Informasi Geografis juga dilakukan untuk melihat persebaran zona potensi longsor pada daerah penelitian.

Studi potensi longsor berdasarkan interpretasi data *Ground Penetrating Radar* (GPR) dan peta berbasis Sistem Informasi Geografis (SIG). Penelitian dengan GPR terdiri dari 9 lintasan yang berorientasi relatif timurlaut-baratdaya dan 4 lintasan yang berorientasi timur-barat. Pada pembuatan Peta Kerentanan Longsor berbasis SIG, digunakan 5 parameter, yaitu curah hujan, kemiringan lereng, ketebalan tanah, tataguna lahan, dan jenis batuan.

Pada penampang radargram GPR diidentifikasi terdapat 3 lapisan, yaitu *soil* ($\pm 0-1$ m), lapisan campuran *soil* dan breksi ($\pm 1-2,5$ m), serta *bedrock* dengan litologi breksi gunungapi ($\pm 2,5-6$ m). Batas campuran *soil* dan breksi dan *bedrock* dianggap sebagai bidang gelincir longsor dengan arah kemiringan kearah barat dan bentuk bidang gelincir yang relatif rata. Tipe longsor yang mungkin terjadi, yaitu tipe longsor campuran antara *debris flow* dan *translational landslide*. Berdasarkan Peta Kerawanan Longsor berbasis SIG, diperoleh 3 kelas kerawanan bencana longsor, yaitu kerawanan rendah (3,34 – 3,52), sedang (3,52 – 3,7), dan tinggi (3,7 – 3,9). Daerah dengan tingkat kerawanan sedang sampai tinggi perlu diwaspadai dan diharapkan adanya tindakan mitigasi, terutama pada bulan-bulan basah, yaitu bulan Oktober hingga April untuk mengurangi risiko atau dampak akibat peristiwa tanah longsor.

Kata Kunci: Bidang Gelincir, GPR, Potensi Tanah Lonsor, SIG

**THE STUDY OF LANDSLIDE POTENTIAL BASED ON THE GEOMETRY OF
GROUND PENETRATING RADAR (GPR) DATA AND GEOGRAPHIC
INFORMATION SYSTEM (GIS) IN KARANGTENGAH, IMOGIRI, BANTUL,
D.I.YOGYAKARTA**

Catherine Monalisa Panggabean¹⁾

¹⁾Geophysical Engineering UPN “Veteran” Yogyakarta

ABSTRACT

Landslides are one of the mass movements forms that moves along the slip plane. Landslides often occurred in the Imogiri area, Bantul, because more than 50% of the Bantul Regency area is a landslide prone area. GPR studies were conducted to obtain information about weathered layer and slip plane's geometry and GIS studies were also carried out to see the distribution of landslide prone area.

Landslide potential studies was conducted based on the interpretation of Ground Penetrating Radar (GPR) data and Geographic Information System (GIS)-based maps. The study with GPR consisted of 9 lines with northeast-southwest orientation and 4 lines with east-west orientation. In order to obtain Landslide Hazard Map, 5 parameters were used, which are precipitation data, slope data, soil thickness data, land use data, and lithology data.

Based on GPR radargram, it was identified that there were 3 layers, which are soil ($\pm 0-1$ m), a layer of soil and volcanic breccia mixtures ($\pm 1-2.5$ m), and a bedrock with volcanic breccion lithology ($\pm 2.5-6$ m). The boundary of the mixture of soil and volcanic breccia and bedrock is considered to be the landslide slip plane with slope direction towards the west with a relatively flat slip plane. The type of lindslides that may occur is a mixed type between debris flow and translational landslide. Based on the GIS-based Landslide Hazard Map, 3 classes of landslide disaster vulnerability were obtained, namely low vulnerability (3.34 – 3.52), moderate vulnerability (3.52 – 3.7), and high vulnerability (3.7 – 3.9). Areas with moderate to high levels of vulnerability need to be watched out for and landslide mitigation measures are to be expected, especially in the wet season, (October to April) to reduce the risk or impact of landslide hazard.

Keywords : GIS, GPR, Landslide Potential, Slip Plane