

## **ABSTRACT**

*Prampelan Village, Kaliangkrik Subdistrict, Magelang Regency, is an area with a history of recurrent landslides, including events that occurred on January 26, 2021, due to heavy rainfall and on October 13, 2025, caused by leakage from a PAMSIMAS water pipeline. This study aims to identify subsurface conditions and landslide susceptibility based on shear-wave velocity ( $V_s$ ),  $V_p/V_s$  ratio, and Poisson's ratio ( $\nu$ ). The method used in this study is microtremor measurement employing the Horizontal to Vertical Spectral Ratio (HVSr) approach. This method is passive, non-destructive, and efficient for field investigations, making it suitable for identifying subsurface structures through HVSr curve analysis and inversion. Measurements were conducted at 36 points surrounding the landslide area. The results indicate that the near-surface layer in the landslide area is predominantly composed of soft to medium soils, with  $V_s$  values ranging from 198.65 to 688.22 m/s. At greater depths, the  $V_s$  values increase to 2909.78 m/s, indicating the presence of competent bedrock. The analysis of elastic parameters at the landslide points shows  $V_p/V_s$  ratio values ranging from 2.14 to 3.85 and Poisson's ratio ( $\nu$ ) ranging from 0.36 to 0.46. These conditions indicate partially saturated to water-saturated materials, reflecting weathered layers with high porosity. Areas with the highest susceptibility are generally characterized by low  $V_s$  values accompanied by high  $V_p/V_s$  and Poisson's ratio values, indicating soft, poorly compacted, and water-saturated subsurface materials. In addition, several areas that have not yet experienced landslides also exhibit high water saturation levels, suggesting their potential to develop into future landslide zones if continuous increases in water loading occur.*

**Keywords:** HVSr, shear wave velocity ( $V_s$ ),  $V_p/V_s$ , Poisson's ratio, landslides, Prampelan.