

# DAMAGE AND LOSS ASSESSMENT MODELING OF AGRICULTURAL LAND FROM LAHAR IN GENDOL WATERSHED, YOGYAKARTA, INDONESIA

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**Abstract:** The last period of Merapi eruption was occurred from 26 October until 5 November 2010. It was the biggest eruption in the last 10 years with four in the VEI (Volcanic Explosivity Index) evidenced by 130 million m<sup>3</sup> of tephra volume, and nine kilometres of cloud column height. This study is aimed to assess and estimates the damage and loss resulted from volcanic hazard, in particular lahars which has caused severe impact to the agricultural land, especially in Gendol Watershed of Merapi Volcano. The lahar hazard began as the occurrence of rainy season. The actual lahar impacted area in 2011 has been measured from field survey using D-GPS, while the estimation of upcoming lahar events are modelled using LAHARZ. LAHARZ using DEM (Digital Elevation Model) and several scenarios of lahar volumes as input to create delineations of areas with potential lahar inundation from selected scenarios. DaLA (Damage and Loss Assessment) method which developed by ECLAC is used in this study to measure the value of damage and loss of impacted farming activities. The results of this study show that the minimum area which impacted by lahar flood in Gendol watershed is 622.30 ha which triggered by 10 million m<sup>3</sup> of lahar scenario, and the most extensive area is 1562.26 ha from 40 million m<sup>3</sup> of lahar scenario. Based on DaLA, the total value of damage from 10 million m<sup>3</sup> lahar scenario is 1.1 million Rupiah (120,000 USD), while 40 million m<sup>3</sup> scenario will cause 2.6 million Rupiah (270,000 USD) in its total value of damage.

Keyword: modelling, lahar, LAHARZ, DaLA