



Land Subsidence Detection in Jakarta Province Using Sentinel-1A Satellite Imagery

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The land surface in DKI Jakarta Province is thought to have experienced relatively continuous subsidence because of natural processes and man-made activities. This research was carried out to evaluate the rate of land subsidence in Jakarta Province. The data used in this study are two pairs of Sentinel-1A level 1 Single Looking Complex (SLC) images which were acquired in 2019 and 2020. The data was processed using the DInSAR method to examine the rate of land subsidence. The results show that the land subsidence rate in Jakarta Province during the 2019-2020 period varies from 1.8 cm to -10.7 cm/year. From 2019 to 2020, the average land subsidence in the City of North Jakarta is around -4.9 cm/year, East Jakarta is around -2.5 cm/year, West Jakarta is around -4.8 cm/year, Central Jakarta is around -3.1 cm/year, and South Jakarta about -2.8 cm/year. Land subsidence occurs mostly in coastal areas and near estuaries caused by the nature of alluvial deposition materials. It has caused damages to road infrastructure in several regions of Jakarta Province, such as Mutiara Beach, West Cengkareng, and Pademangan.

Keywords: coastal areas, DInSAR, land subsidence, satellite imagery, Sentinel-1A