

Urban Land Use Type Analysis Based on Land Subsidence Areas Using X-Band Satellite Image of Jakarta Metropolitan City, Indonesia

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Abstract : Jakarta Metropolitan City is located on the northwest coast of West Java province with geographical location between 106°33' 00"-107°00'00"E longitude and 5°48'30"-6°24'00"S latitude. Jakarta urban area has been suffered from land subsidence in several land use type as trading, industry and settlement area. Land subsidence hazard is one of the consequences of urban development in Jakarta. This hazard is caused by intensive human activities in groundwater extraction and land use mismanagement. Geologically, the Jakarta urban area is mostly dominated by alluvium fan sediment. The objectives of this research are to make an analysis of Jakarta urban land use type on land subsidence zone areas. The process of producing safer land use and settlements of the land subsidence areas are very important. Spatial distributions of land subsidence detection are necessary tool for land use management planning. For this purpose, Differential Synthetic Aperture Radar Interferometry (DInSAR) method is used. The DInSAR is complementary to ground-based methods such as leveling and global positioning system (GPS) measurements, yielding information in a wide coverage area even when the area is inaccessible. The data were fine tuned by using X-Band image satellite data from 2010 to 2013 and land use mapping data. Our analysis of land use type that land subsidence movement occurred on the northern part Jakarta Metropolitan City varying from 7.5 to 17.5 cm/year as industry and settlement land use type areas.

Keywords : land use analysis, land subsidence mapping, urban area, X-band satellite image

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