EGU22-1721
https://doi.org/10.5194/egusphere-egu22-1721
EGU General Assembly 2022

On the Disaster Risk Reduction of Land Subsidence in Indonesia's Northern Coastal Areas of Java

Hasanuddin Z. Abidin[1], Heri Andreas[1], Irwan Gumilar[1], Teguh P. Sidiq[1], Dhota Pradipta[1], and Bambang D. Yuwono[2]

[1]Institute of Technology Bandung, Department of Geodesy and Geomatics Engineering, Bandung, Indonesia (hzabidin@gmail.com)

[2]Universitas Diponegoro, Department of Geodetic Engineering, Semarang, Indonesia

Land subsidence has been observed in several locations along Indonesia's northern coast of Java, most notably in Jakarta, Indramayu, Semarang, Demak, and Pekalongan. It could be caused by a combination of natural and anthropogenic processes, such as excessive groundwater extraction, natural consolidation of alluvium soil, building and construction load, and tectonic activity. Observations using various geodetic methods, including Leveling, GPS, and InSAR, show that typical subsidence rates of 3-10 cm/year have occurred and continue to occur at these locations. The rates vary both spatially and temporally. Coastal subsidence causes coastal inundation, flooding, and infrastructure sinking and cracking, resulting in significant infrastructure, economic, environmental, and social losses. Coastal flooding and inundation are typically exacerbated by high tides, high waves, and heavy rain. Given the significant impact of land subsidence in the coastal area on community life activities and regional development, sustainable disaster risk reduction management must be used to prevent and mitigate land subsidence. Furthermore, because this phenomenon persists, both the government and the community must continue to adapt to its consequences. This paper describes the observations and effects of land subsidence on Java's north coast, specifically in Jakarta and Semarang. Initiatives and programs to aid in prevention, mitigation, and adaptation will be proposed and discussed.