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The Bamboo Utilization for Mitigation of Soil Liquefaction Potential at Civilization Area, Study Case at Surabaya, East Java

Jeremy Gohitua MacArthur and Ratih Sukma Prabaningrum

Institute Teknologi Sepuluh Nopember, Indonesia, jeremygohitua@gmail.com, ratih.sukma@gmail.com

Supervisor: Dr. Widya Utama, DEA

Institute Teknologi Sepuluh Nopember, Indonesia,

Indonesia located at the confluence of four tectonic plates, those are Pacific Plate, Philippine Plate, Indo-Australian Plate, and Eurasian Plate. The location of Indonesia made Indonesia had a relatively high potential of earthquake activity. So, Indonesia should be aware about mitigation disaster to avoid or even reduce the risk and loss from disaster.

Liquefaction is one of the Permanent Ground Deformation (PGD) which happen due to earthquakes and tectonic activity on a certain scale that occur on a saturated sandy soil and can resulting the losing power of soil due to its decreasing of soil stress and the increasing of excess pore pressures. The soil has a tendency to solidify during an earthquake and when it occurs in a short period of time, the pore water in the soil does not have enough time to exit, this condition can make an increase in pore water stress resulting in reduced effective soil stress and reduced contact voltage between sand particles.

This paper discusses a way to make this supportive data in civilization area and reduce the potensial hazard. It is done by overlying Landsat Imagery map on geological map of the research area. Shortly, a classification is done on the research area that further subdivide it into potential area and un-potential area by applying a scoring of Liquefaction hazard potensial value. The scoring parameters are based on the comparison between the spread of vegetation, land usage and geological condition at Surabaya. The liquefaction potensial map used as a reference of sampling data location to identify the characteristic of the soil.

The intend of this paper is to determine the utilization of bamboo for mitigation of soil liquefaction potensial at civilization area by evaluate the effect of bamboo root to soil strength depend on the soil structure who can maintain of hydrologic system to ligature the soil and water. The growth of bamboo which relatively fast, does not require much space and adaptive to the environment is expected can strengthen the soil bonding in a relatively short time and quite economically.