

Mechanism of Landfill Movement During Earthquakes, Estimated from Vibration Characteristics and Topographical Features in Nishinomiya City, Hyogo Prefecture

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Residential landfills spread in urban areas have collapsed accompanied by earthquakes. For example, during the 2011 off the Pacific coast of Tohoku Earthquake, 64 large-scale embankment collapsed. Landfill maps are publicly available, but not all the residential landfills suffer from earthquakes. It is important to grasp which landfills collapse in a particular earthquake for effective disaster reduction. In this study, we aim to clarify the deformation mechanism of landfills during earthquake for this purpose. The targeted landfills in this study are those part of which collapsed accompanied by the 1995 Hyogo-ken Nanbu Earthquake. First, we created DSM(Digital Surface Model) before and after land development and estimated the distribution of the topographic parameters of the landfills by taking their differences. Second, surface wave exploration were conducted in order to estimate the S-wave velocity structure in and around the landfills. Lastly, microtremors were observed to understand the seismic ground motion characteristics. Combined with the results from these observations and analyses, we discussed the factors that affected whether the landfills collapsed or not during the earthquake.