

Analysis of topographical characteristics of flooded areas for constructing simple warning system of pluvial flooding

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Pluvial flooding is a major disaster in Japanese urban areas. Physical models are often used for assessing pluvial flood risk, but the models are complex. Therefore, this study aims to analyze topographical characteristics of flooded areas in the 23 wards of Tokyo as the basis for constructing a simple warning system. At first, we extracted four factors as topographical characteristics: depression depth, catchment volume, elevation difference and slope using a digital elevation model (DEM) for the whole study area, but there were some problems when the methods were simply applied to the DEM. Accordingly, we extracted the factors only for roads, and then compared the obtained values for flooded and non-flooded areas. According to t-test, there were significant differences between the two types of areas for all factors. However, similar values sometimes occur for these areas, indicating that not only topography but also rainfall and drainage systems should be analyzed in future work.

Keywords: pluvial flooding, topographical characteristics, road, DEM, GIS