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The Extraction of Flood Risk Factors and Assessment of Flood Disaster Using GIS and RS Image Data

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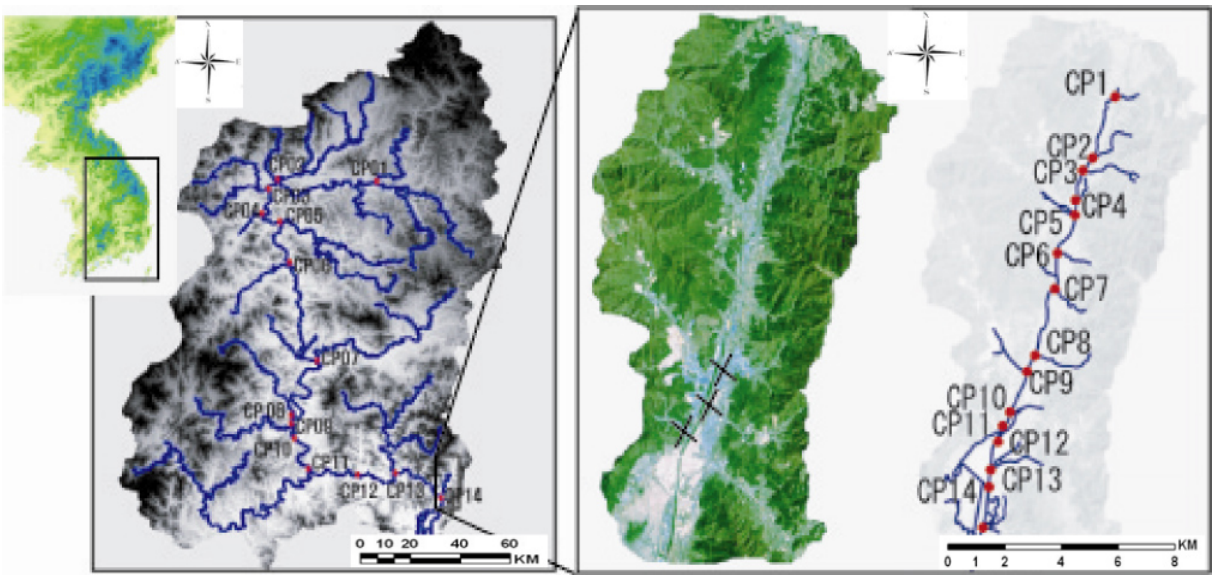

Recently, floods have increased due to rapid urbanization and human activity in the lowland. Flood effects can be local, impacting only the local community, or it can be very large, affecting the entire river basins. Korea has also increased victims and economic damages caused by frequent localized torrential downpours. The authors have determined Nakdong river basin, Korea as their prime research focus area. Its length is 521.5 kilometers and area is 23,817km^2. The main aim of this study is to extract flood risk-factors for flood risk assessment by integrating topographic DEMs data, geomorphic data and remote sensing data in a GIS environment. The integration of GIS, remote-sensing image and field data has the potential to provide valuable information about vulnerable flood risk areas and reduces the ambiguity of the two relationships between mainstream and tributary. Moreover the authors perform the assessment for flood disaster prediction. The flood risk assessment consists of the concept of flood risk at the point of confluence (FRC) and flood risk related to watershed area (FRW). At the first stage, FRC is defined as risk factors using the inundation vulnerable index (IVI), flow capacity (FC), flow resistance (FR) on the confluence sites of the national-river and regional 1st class river considering the flood risk vulnerability of overflow and flood levee failure. Next stage, FRW is defined as risk factors using the relative digital elevation model (REM), micro-landform classification (MLC), and land-use (LU) caused by overflow and flood levee failure. Raster calculation of FRW determines identifying inundation areas related to water depth and draining. In order to assess the flood risk, the authors applied method of quantitative index model to the 14 confluences sites. The quantitative index model indicates the priority ranking for assessing a flood risk. As a result, it was possible to identify the confluence point with high flood risk and the

vulnerable inundation areas based on the flood risk factors and using GIS spatial analysis. This model describes the extract method of risk factors for improving flood map accuracy. The results of this study illustrate one of the different FRM (flood risk management) approaches how land is managed and how the levees play a most important role in the lowland and flood plain.

Keywords: GIS, RS(remote-sensing), Flood Risk Factor, Vulnerability, Flood Risk Assessment