ArcGIS Based Multi – DEM Urban Flood Resilience Assessment: A Case Study of Gyor City

Ibrar Ullah[1], Gábor Kovács[1]*, Tibor Lenner[1]
[1]*Eötvös Loránd University, Savaria University Center, Hungary*
**kovacs.gabor@sek.elte.hu*

Urban flooding has gained great attention in recent years since population in urban areas have become more vulnerable to climatic extremes. To cope with an increasing flooding issue, there has been an increased effort to manage flood management in urban areas. Similarly, in this study, an attempt was made to develop a two Digital Elevation Model (DEM) GIS based thematic map to assess flood resilience for the Gyor city, Hungary, which had a history of been impacted by of flood. Three elements i.e., hazard, exposure, and coping capacity with each having pre-determined parameters were selected and processed through Analytic Hierarchy Process (AHP) approach. The product value map was then analyzed in ArcGIS using Modified version of Specialized Flood Resilience Model (S-FRESI). Two resultant resilience maps were obtained i.e., SRTM based DEM resilience map and manually digitized contours based DEM resilience map. The resultant SRTM based resilience map was then subtracted from contours based resilience map in ArcGIS software. The final resilience map shows that there were 14.3% differences observed between the two maps which is comparatively low, but still significant. Therefore, it is preferable to utilize the contours based map for more reliable results. The technique shows that contours based DEM maps are more suitable in obtaining flood related hazard maps.