

Modeling of tsunami inundation and hazard mitigation - A case study of Hambantota urban area

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Several accurate modeling techniques for tsunami inundation and hazard mitigation have been developed all over the world after the event of tsunami on 24th December 2004. In this study, it was tried to apply a low cost methodology to identify the inundation and evacuation areas at Hambantota town area. A Bathymetric Digital Elevation Model (DEM) was generated using high resolution sonar data, nautical charts and freely available GEBCO data. Elevation data were extracted for the topographic DEM from stereo-pair images, RTK GPS[®] survey, Topography maps, and freely available SRTM (Shuttle Radar Topography Mission). The DEM was interpolated using a natural neighbor technique. Base data of building types and population for the loss estimation and evacuation system were gathered by field work. The internet-based Simulation Platform for Inundation and Risk Evaluation (INSPIRE) which is a web-based tool developed by Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES), was used to estimate the tsunami travel time, inundation height and the current velocity. Evacuation centers and paths were identified by Evaluation System for Computing Accessibility and Planning Evacuation (ESCAPE) which was also developed by RIMES. Simulation results are plotted as maps, which can be downloaded as Google Maps.

Simulation result shows that the area elevated up to five meters in the study area was inundated by the tsunami event in 2004 at a magnitude of 9.2 Richter scale where earthquakes are generated in the Sunda trench. Six centers were identified as evacuation centers at the Hambantota Town area, Panuwala and Sippukulama. The results were validated with the previous studies in the same area and found out that the inundation height, travel time and the current velocity are almost similar with the results.

Keywords: digital elevation model (DEM), inundation, evacuation, ESCAPE, INSPIRE

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