**Flood hazard mapping in tropical environment using airborne Lidar: A Case study in Kota Tinggi, Johor**

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**ABSTRACT:** Geospatial technology has been widely used to support hydrodynamic modelling both in urban and rural areas. Advancements in LiDAR technology have permitted development of dense and accurate Digital Terrain Model (DTM) and Digital Surface Model (DSM). This study presents a method that combines hydrodynamic model and geospatial technology in simulating flood and generation of flood hazard map in Kota Tinggi City, district of Johor, Malaysia. In December 2006 and January 2007 two successive flood waves occurred in this area which resulted in billions of economic loss and high fatalities. Airborne LiDAR data is used to produce detailed DTM and Manning’s coefficient values are estimated based on landcover map produced by Landsat 5 TM image obtained in 2007. The flood events were simulated using 1D-2D SOBEK model developed by WL|Delft Hydraulics. The required input parameters such as river cross-section, discharge in the upstream area, water level and flood extent data were obtained from the Drainage and Irrigation Department of Malaysia. The flood event in this area is simulated based on 2-, 25-, 50, 100-, and 200-years return period floods. The results will be evaluated based on the flood behaviour (i.e. inundation depth, flood velocity, warning time, inundation period and flood rising) of different flood frequencies and at different times. Flood hazard map is generated by combining maximum inundation depth and maximum flood velocity to depict different levels of hazard that accounts the worst case flood scenario. Furthermore, all these results were combined to estimate the probability of flood occurrence in this area which helps in determining of suitable evacuation areas.