A100-year maximum flood susceptibility mapping using integrated hydrological and hydrodynamic models: Kelantan River Corridor, Malaysia.

ABSTRACT

The Kelantan River is located in the northeastern part of Peninsular Malaysia and presents a great challenge in terms of long and recurring floods. The recent floods, in the year 2005, 2006, 2007, 2008 and 2009 due to heavy monsoons rainfall have triggered these events along Kelantan River Basin. This paper summarizes the findings of the flood susceptibility analysis using hydrological and hydrodynamic models with the aid of GIS tools and remote sensing data. Terrain information such as historical flooded areas for the year 2007 was extracted from RADARSAT images. Further, digital elevation model and precipitation information were updated to enable the quantification of flood-associated attributes. For hydrological and hydrodynamic analyses, data obtained from Department of Irrigation and Drainage, Government of Malaysia, has been used corresponding to rain gauge/discharge stations along the Kelantan River. Data on daily and hourly average discharge and peak discharge are modelled for all the stations for different periods. Probability density moisture combined with rainfall simulation models was applied to determine the maximum flood susceptibility map. Results indicate that the flood-prone areas delineated on this map correspond to areas that would be inundated by significant flooding (approximately the 100-year flood).

Keyword: Flood; Susceptibility; Remote sensing; GIS.