Impact of Malaysia major flood to river geomorphology changes and total suspended solid using GIS technique

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Abstract

Flood is the most common type of disaster in Peninsular Malaysia. In December 2014, a major flood event occurred in Pahang River that recorded the worst flood ever hit Pahang River Basin and Malaysia generally. Twelve sampling station has been chosen which covered of upstream, middle stream and downstream parts of Pahang River. This study focuses on scrutinizing the processes of the river geomorphology changes using geographic information system and other techniques. Those stations are Jerantut Feri, JPS Tembeling, Chenor and Pekan. The 3D modelling surface showed that the bathymetric shape of Pahang River bed was severely affected by the flood due to collapse of river banks, land use changes and anthropogenic activities. However, other stations are also affected by the flood but it is not significant according to cluster group constructed. Total suspended solid was classified into three group using cluster analysis. The contributors of sedimentation problems in Pahang River are from unsustainable land use such as urbanization, agricultural activities, industrialization which are trapping the bed sediments and river band erosion caused by flood phenomenon. Sinuosity index (SI) of Pahang River shows that high percentage of changes occurred in the upstream at Tembeling River and Jelai River with the highest percentage recorded at 45%. SI recorded at middle stream shows a significant change with the percentage of 20.7%. While at downstream, the SI recorded three significant changes from 16.0% to 20.3%. Based on statistical analysis, significant changes with moderate correlation in R squared value at R-2 = 0.6669 was obtained between SI changes and water level that occurred from 2010 to 2015. Pahang River geomorphology change analysis and river bed geometric analysis are very important in order to decide the best mitigating measure and management plan that will overcome the biggest problem of Pahang River, that is, flood - that occurs every year. Generally, this study is very important to gather information on the effect of 2014 major flood in Pahang River in order to manage the Basin of Tropical River. In future, for mitigation measure, alternative management is proposed for Pahang River Maintenance such as service of natural flood ponds and flood mitigation projects.

Keywords

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KeyWords Plus: WATER-QUALITY ASSESSMENT; EVOLUTION; PAHANG

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