Flood Hazard Analysis (FHAn) Using Multi-Criteria Evaluation (MCE) in Penampang Area, Sabah, Malaysia.

ABSTRACT

Flooding is one of the major natural disasters in Sabah, Malaysia. Several recent cases of catastrophic flooding were recorded especially in Penampang area, Sabah (e.g. July 1999; October 2010; April 2013; October & December 2014). Heavy monsoon rainfall has triggered floods and caused great damage in Penampang area. The 2014 floods has affected 40,000 people from 70 villages. The objectives of this paper are (i) to determine the Flood Hazard Level (FHL) and (ii) to determine the factors contributing to the flood occurrences. In this study, eigth (8) parameters were considered in relation to the causative factors to flooding, which are: rainfall, slope gradient, elevation, drainage density, landuse, soil textures, slope curvatures and flow accumulation Flood Hazard Analysis (FHAn) map were produced based on the data collected from the field survey, laboratory analysis, high resolution digital radar images (IFSAR) acquisation, and secondary data in three (3) different period (2002, 2008 and 2014). FHL were defined using Multi Criteria Evaluation (MCE) technique integrated with GIS software. As a result of the calculation and interpretation, the average ratio of the areas under the curve was 0.839, and thus can be argued that validation prediction accuracy was 83.90%. The developed model will be a very valuable resource for consulting, planning agencies and local governments in managing risk, land-use zoning and remediation efforts to mitigate risks. Moreover, the technique applied in this study can easily be extended to other areas, where other factors may be considered, depending on the availability of data.