Assessment of Flood Hazard Areas Using Remote Sensing and Spatial Information System in Bilate River Basin, Ethiopia

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Abstract

Floods are considered as harmful and the most dangerous natural disaster affecting annually millions of people. This study aimed to present a geospatial information system based on multi-criteria evaluation techniques (MCE) methodology for flood hazard areas mapping. The distance from drainage network, slope, recurrent heavy rainfall, curve number, normalized difference vegetation index (NDVI), and the population density are the six factors considered as relevant to the flood hazard areas mapping of the basin. The final flood hazard areas map of the basin shows a satisfactory agreement between the spatial distribution of historical floods that happened in the basin for the past years and the flood hazard zones. The flood hazard map showed that Bilate-Humbo area at the very entry of Bilate River to Lake Abaya, Shashego area at Boyo Lake resulting from Guder River, and Shashego area at Boyo Lake resulting from Metenchiso River are the areas of very high flood hazard. These areas are categorized by low NDVI, gentle slope, high rainfall, high curve number and close to the drainage network. The proposed methodology of assessing flood hazard areas using spatial information system delivers a good basis for developing a system of flood risk management in a river basin

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