FLOOD SUSCEPTIBILITY MAPPING USING THE ANALYTICAL HIERARCHY PROCESS FOR MANDIPATTU ARU RIVER BASIN, EASTERN PROVINCE, SRILANKA

K.Linggajini[1], H.K.Nandalal[2]

[1] *Department of Civil Engineering, Faculty of Engineering, University of Peradeniya, Sri Lanka*
linggakalai@gmail.com, hemalin@eng.pdn.ac.lk

Abstract - Though Sri Lanka is a water-rich country, still water management is not efficiently enforced. Sri Lanka is highly vulnerable to climate change and it will affect huge livelihood within a very short period. During3 heavy rainfall events, there is a major responsibility for keeping the reservoirs safe. Otherwise, the agricultural lands, lots of accommodations, and most life forms will be wiped out. Flood susceptibility mapping functions as a significant alternative for flood prevention and mitigation strategies. This study aims to delineate the flood susceptibility zones for the area of Mandipattu Aru River Basin situated in Eastern Province, Sri Lanka using a multi-criteria approach, particularly the Analytical Hierarchy Process (AHP) technique, and Geographic Information Systems (GIS). Nine flood causative Criteria were adopted for this study: Topographic Wetness Index (TWI), Elevation, Slope, Precipitation, LULC, NDVI, Distance from River, Drainage Density, and Soil Type. All factors were input as raster datasets in ArcGIS. The AHP technique was used to calculate the factor weights. For that, the relative importance of the selected factors was ranked. The flood hazard map developed from the AHP technique was examined for verification with a satellite-based historical inundation map. Further, this study shows that 89% of flooded historical areas were located on the created flood map. Therefore, assessments suggest that the presented flood hazard model has been accurately predicted.

Keywords: Flood; Precipitation; AHP technique; Overlay; Risk