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Modeling of Dam Break Flood Wave Propagation Using HEC-RAS 2D and GIS: A Case Study of Taksebt Dam in Algeria

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Abstract : This study aims to predict the consequences associated with the propagation of the flood wave that may occur after the failure of the Taksebt dam and suggest an efficient emergency action plan (EAP) for mitigation purposes. To achieve the objectives of this study, the hydrodynamic model HEC-RAS 2D was used for the flood routing of the dam break wave, which gave an estimate of the hydraulic characteristics downstream the Taksebt dam. Geospatial analysis of the simulation results conducted in a Geographic information system (GIS) environment showed that many residential areas are considered to be in danger in case of the Taksebt dam break event. Based on the obtained results, an emergency actions plan was suggested to moderate the causalities in the downstream area at risk. Overall, the present study showed that the integration of 2D hydraulic modeling and GIS provides great capabilities in providing realistic view of the dam break wave propagation that enhances assessing the associated risks and proposing appropriate mitigation measures.

Keywords : taksebt dam, dam break, wave propagation time, HEC-RAS 2D
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