

A new assessment methodology for flood risk: a case study in the Indus River basin

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Abstract In this paper, the authors suggest a new flood risk assessment based on extreme discharge of the end-of-the-21st century scenario, and developed a model based on the concept of flood hazard that was composed of extreme discharge in climate change scenarios, saturation deficit during the extreme discharge, and flood periphery related to the flood disaster. The purpose of this study was to estimate, on a national scale, the number of the population possibly affected by flooding with each additional metre of inundation. The Indus River basin in Pakistan was selected as the prime research focus area. As a result, our integrated analysis was capable of predicting disaster damage caused by a hazard in a given area, considering the occurrence probability of the hazard and the vulnerability of the area. This approach is expected to play an important role in emergency response on a national level.

Key words flood hazard; extreme discharge; saturation deficit; inundation depth