

Influence of Precipitation and Land Use on Extreme Flow in Prek Thnot River Basin of Mekong River in Cambodia

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Abstract : The damages caused by hydrological extremes such as flooding have been severe globally, and several research studies indicated extreme precipitations play a crucial role. Cambodia is one of the most vulnerable countries exposed to floods and drought as consequences of climate impact. Prek Thnot River Basin in the southwest part of Cambodia, which is in the plate and plateau region and a part of the Mekong Delta, was selected to investigate the changes in extreme precipitation and hydrological extreme. Furthermore, to develop a statistical relationship between these phenomena in this basin from 1995 to 2020 using Multiple Linear Regression. The precipitation and hydrological extreme were assessed via the attributes and trends of rainfall patterns during the study periods. The extreme flow was defined as a dependent variable, while the independent variables are various extreme precipitation indices. The study showed that all extreme precipitations indices (R10, R20, R35, CWD, R95p, R99p, and PRCPTOT) had increasing decency. However, the number of rain days per year had a decreasing tendency, which can conclude that extreme rainfall was more intense in a shorter period of the year. The study showed a similar relationship between extreme precipitation and hydrological extreme and land use change association with hydrological extreme. The direct combination of land use and precipitation equals 37% of the flood causes in this river. This study provided information on these two causes of flood events and an understanding of expectations of climate change consequences for flood and water resources management.

Keywords : extreme precipitation, hydrological extreme, land use, land cover, Prek Thnot river basin

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