Transboundary hydrology, climate change and its impact on flood factors in the Kabul-Swat floodplain of Hindu Kush region

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This study analyses the transboundary hydrology, climate change and its impact on flood factors in the Kabul-Swat floodplain, Hindu Kush region. In action 3rd, the Sendai Framework for disaster risk reduction has insisted to strengthen regional exchange on disaster risk information for better understanding of complex transboundary risks, cascading and compound disasters. It was found from the analysis that globally there is a rising trend of hydro-meteorological events both in terms of frequency and intensity and the same is attributed to changing climate scenario. The Kabul-Swat floodplain is no exception to it. During past decade (2011-2022), Pakistan has been declared amongst the top ten climate affected countries. The analysis revealed that the recurrences of flash floods, riverine floods, drought, long wet spells, intense rainfalls, heavy snowfall, late and early rainy seasons and rising trend in temperature have been identified as the major flood contributing factors and clear manifestations of climate change impacts. It was found that in the study region, the drought event (1997-2005) has paralyzed the agriculture sector and put tremendous pressure on the regional economy. It was followed by century worst flood of 2010, 2013 and 2022, and caused billions of US$ damages to critical infrastructure, agriculture and other sectors. The analysis revealed that in Afghanistan investments have been made on building new dams over the Kabul River and it has posed serious implications on the downstream communities of Afghanistan and Pakistan. In a changing climate scenario, the Indus Water Treaty is at stake, while Kabul River Treaty has yet to mature. In the study region, hydro-meteorological disasters are expanding the canvas and thereby calls for effective mechanism of forecasting, early warning, response, adaptation and mitigation to minimize the flood impacts.

Keywords: Climate Change; Transboundary Hydrology; Intense Rainfall; Flood; Agriculture