

Impact of Global Warming on the Total Flood Duration and Flood Recession Time in the Meghna Basin Using Hydrodynamic Modelling

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Abstract : The floods cause huge losses each year, and their impact gets manifold with the increase of total duration of flood as well as recession time. Moreover, floods have increased in recent years due to climate change in floodplains. In the context of global climate change, the agreement in Paris convention (2015) stated to keep the increase in global average temperature well below 2°C and keep it at the limit of 1.5°C. Thus, this study investigates the impact of increasing temperature on the stage, discharge as well as total flood duration and recession time in the Meghna River basin in Bangladesh. This study considers the 100-year return period flood flows in the Meghna river under the specific warming levels (SWLs) of 1.5°C, 2°C, and 4°C. The results showed that the rate of increase of duration of flood is nearly 50% lesser at $\Delta T = 1.5^\circ\text{C}$ as compared to $\Delta T = 2^\circ\text{C}$, whereas the rate of increase of duration of recession is 75% lower at $\Delta T = 1.5^\circ\text{C}$ as compared to $\Delta T = 2^\circ\text{C}$. Understanding the change of total duration of flood as well as recession time of the flood gives a better insight to effectively plan for flood mitigation measures.

Keywords : flood, climate change, Paris convention, Bangladesh, inundation duration, recession duration

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