



Flood Risk Characterization of Highly Flood-prone Data Scarce Region under Changing Climate

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It is evident that changes in climate alter the incidence of hydro-climatic extreme events, specifically floods, which are likely to cause irreparable socio-economic and ecological damages. With a 7,516 km coastline that is prone to climate-mediated disturbances and cyclones, the eastern coast of the Indian subcontinent is comparatively more vulnerable to the changing climate and land use with higher incidences of extensive flooding. Therefore, the policy-makers and decision-making authorities are dependent on the scientific community to provide reliable estimates of hydro-meteorological variables for simulating extreme events under the impact of climate change. However, a comprehensive flood risk framework at a finer administrative level is not yet available under the Indian scenario that assesses the changing dynamics and complexities of different components of climatic risk (hazard, vulnerability, and exposure). The present study attempts to demonstrate a proposed framework of flood risk assessment for a highly flood-prone deltaic region of Mahanadi River Basin, India, under climate change scenarios for near-future (the 2040s) at present-day vulnerability and exposure status. It was noted that changes in future flood risk are highly influenced by the vulnerability and exposure status of the region. Lower vulnerability and exposure in coastal sub-districts reduces the overall risk even if a higher flood hazard is observed. Under both future scenarios, RCP 4.5 and 8.5, the number of villages under high hazard zones with greater flood magnitude has increased. Therefore, it thrusts upon the need to adopt stringent actions for devising better adaptation strategies and sustainable planning which can aid in lowering the vulnerability of the region to future floods.