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Title: Vulnerability and Risk Assessment of Extreme Weather Events- A Case Study from Bangladesh
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Abstract:
Assessment of hazard, vulnerability and risk of extreme weather are essential in order to inform and implement appropriate adaptation/prevention/mitigation strategies. Within the present climate, extreme variations of weather and climate have severe impacts, particularly in less-developed countries like Bangladesh. Due to complex nature and uncertainties in future climate change predictions, it is not feasible to detail assessment of vulnerability at detailed scales for potential hazard and risk. When aiming to understand the assessment of hazard, vulnerability and risk, there are two extreme operating scales, global (mostly in climate change) and local (mostly in natural hazards) plays dominant roles of interactions. Though different approaches and methods exist for running hazard, vulnerability and risk assessment, but still difficult to address all physical science, engineering, and social science research. In this study, we try to discuss on the human vulnerability and risk assessment approaches, tools and techniques of natural hazard due to extreme weather events (i.e. floods, cyclone). We analyzed different approaches and methods of vulnerability and risk assessment for flood hazard based on medium (1-10 days) and seasonal (1-3 months) ensembles probabilistic forecasts. The multiple weather ensembles (EPS) forecasts of European Center for Medium Range Forecasts (ECMWF) and downscaled Community Climate System Model Version 3 (CCSM3) forecasts data were used to set up hydrological model. Gamma distributions applied to correct the forecasted rainfall using historical observed rainfall. Due to high uncertainty in forecasts information, results summarized that data and inherent low resolutions of the information are major constrains for details comprehensive assessment. Risk and vulnerability rises to be based on multi-scale and cross-scale analyses, considering resilience dimensions and provide innovative tools for understanding, assessing and communicating probabilistic information to the users for decision making. The sectoral responses were developed with possible impacts scenarios based on uncertainty ranges to choose the most robust solution.
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