## A Multi-model Assessment of the Changing Risks of Extreme Rainfall Events in Bangladesh under 1.5 and 2.0 degrees' warmer worlds



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## Global Warming Index (aggregate observations) - updated to Feb 2020



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- Geographical location: downstream country of the GBM basins
- Riverine environment: ~700 hundreds of rivers and their tributaries
- Physiography: ~ 80% of the land is flat and forms mostly floodplain









How would the risks of extreme rainfall events in the pre-monsoon (MAM) and monsoon (JJAS) seasons change across Bangladesh under 1.5 and 2.0 degrees' warmer world conditions?









- **1.** Northwest Drought and low flash flood prone
- 2. Northeast – Severe flash flood and river severe flood
- Southwest Tidal surges 3. and low to severe river floods
- Southwest Tidal surges, river flood and moderate flash floods





Figure: Comparative return periods of MAM daily rainfall (mm/day) during 1986-2015 as per (a) HadRM3P, (b) MIROC5, (c) ETH\_CAM4, (d) CanAM4 and (e) NorESM1 models. ACT, NAT, GHG-only, plus 1.5°C and 2.0°C model ensembles are shown in black, green, orange, blue and red colours respectively (for more see Rimi et al., 2018, HESSD, doi:10.5194/hess-2018-400).

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Comparative return periods of JJAS daily rainfall (mm/day) during 1986-2015 as per (a) HadRM3P, (b) MIROC5, (c) ETH\_CAM4, (d) CanAM4 and (e) NorESM1 models. ACT, NAT, GHG-only, plus 1.5°C and 2.0°C model ensembles are shown in black, green, orange, blue and red colours respectively (for more see Rimi et al., 2018, HESSD, doi:10.5194/hess-2018-400).

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## **Key Messages**

- Human influence on climate is already increasing the risks of extreme rainfall events in Bangladesh
- Reaching 1.5 and 2.0 degrees' warmer world would mean experiencing further increase in the risks
- Nature and severity of the impacts would depend on both GHGs and anthropogenic aerosols
- Policy-makers need to step up to avoid such impacts that would be beyond adaptation capacity











