

Background

- Rising temperatures are exacerbating extreme precipitation and runoff, altering flood wave characteristics across globe (Apurv et al., 2015).
- Population exposure and socio-economic flood impacts are increasing, requiring informed decision making for effective planning (Singh and Dhanya 2024).
- People in areas with >2m inundation are most prone to displacement. Whereas, agriculture and urban inundations causes major economic losses to the region (Custer and Nishijima 2015).
- Shifts in flood wave characteristics is ongoing challenge for flood preparedness and response by relief agencies.



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Flood Vulnerability Under High-Warming Scenarios: Insights from flood wave Projections and Socio-Economic Assessments **Rishi Gupta¹ and Vinay Chembolu¹**

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Results and Discussions

Climate Change →										
	Early Future (2021-2050)					Far Future (2071-2100)				
	Base	SSP1	SSP2	SSP3	SSP5	Base	SSP1	SSP2	SSP3	SSP5
Base	11.28	11.13	11.38	11.75	12.10	_	12.02	12.25	12.40	12.86
SSP1	15.78	15.54	15.94	16.53	17.10	11.13	12.08	12.33	12.51	13.09
SSP2	18.06	17.78	18.22	18.84	19.47	16.23	17.47	17.84	18.10	18.90
SSP3	20.89	20.57	21.05	21.72	22.40	27.59	29.36	30.00	30.44	31.66
SSP5	15.75	15.51	15.91	16.49	17.07	11.09	12.04	12.29	12.47	13.05

Notes* - 1. Values are represented in Millions; 2. Values in Bold shows high emission and high population scenarios





Figure-4; Socio-economic impacts over the catchment under SSP585



Related Article: Gupta, R., & Chembolu, V. (2024). Projecting Socio-Economic Exposure due to Future Hydro-Meteorological Extremes in Large Transboundary EGU River Basin under Global Warming Targets. Water Resources Management, 1-18.





- Displacement risk and GDP disruptions from inundated agriculture and urban areas rise sharply under 3°C and SSP585 scenarios.

References

- Apurv T, Mehrotra R, Sharma A et al (2015) Impact of climate change on floods in the Brahmaputra basin using CMIP5 decadal predictions. J Hydrol 527:281–291
- Custer R, Nishijima K (2015) Flood vulnerability assessment of residential buildings by explicit damage process modelling. Nat Hazards 78:461–496.
- Singh A, Dhanya CT (2024) A novel framework for assessment of human impact of floods: demonstrated for the Indian subcontinent. J Hydrol 635:131110



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