

The interplay between human population dynamics and flooding in Bangladesh: a spatial analysis

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Abstract In Bangladesh, socio-economic and hydrological processes are both extremely dynamic and inter-related. Human population patterns are often explained as a response, or adaptation strategy, to physical events, e.g. flooding, salt-water intrusion, and erosion. Meanwhile, these physical processes are exacerbated, or mitigated, by diverse human interventions, e.g. river diversion, levees and polders. In this context, this paper describes an attempt to explore the complex interplay between floods and societies in Bangladeshi floodplains. In particular, we performed a spatially-distributed analysis of the interactions between the dynamics of human settlements and flood inundation patterns. To this end, we used flooding simulation results from inundation modelling, LISFLOOD-FP, as well as global datasets of population distribution data, such as the Gridded Population of the World (20 years, from 1990 to 2010) and HYDE datasets (310 years, from 1700 to 2010). The outcomes of this work highlight the behaviour of Bangladeshi floodplains as complex human–water systems and indicate the need to go beyond the traditional narratives based on one-way cause–effects, e.g. climate change leading to migrations.

Key words Bangladesh; socio-hydrology; river flooding; human population dynamics