



Water, climate change and society in Bangladesh

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Due to its location in the extensive Ganges-Brahmaputra-Meghna river delta, Bangladesh faces multiple natural hazards, in particular flooding, droughts and sea-level rise. In addition to climate change, transboundary water sharing issues resulting from dam structures such as Farakka Barrage complicate a prognosis on how the rapidly growing population will be affected in the 21st century. This is particularly important as our previous research suggests that the Greater Dhaka population already experiences a significant increase in mortality during droughts (Thiele-Eich et al., 2015).

We attempt to explore the complex interactions between the hydrological system under climate change and anthropogenic impacts due to dams as well as a growing population.

Our approach consists of a quantitative assessment of climate change using over forty years of meteorological data (Bangladesh Meteorological Department) and hydrological data (Bangladesh Water Development Board), and CCSM4 climate model output (NCAR, 1950-2100). In addition to an extensive literature review, we also conducted qualitative interviews with slum dwellers in the megacity Dhaka, the capital of Bangladesh.

Results show that significant changes in flood characteristics are expected for the later part of the 21st century, although they are difficult to quantify down to exact numbers due to large uncertainties. These changes take place over longer stretches of time and thus enable the population of Bangladesh to adapt slowly. Resources such as social capital, which is one of the main tools for slum dwellers to be able to cope with flooding can be altered over time, and as such the system can be considered overall stable and resilient. The presented results will also focus on how the riparian and coastal population is impacted by the interplay of natural changes such as sea-level rise and anthropogenic changes such as Farakka Barrage and the associated reduction in dry season flow.

Thiele-Eich, I.; Burkart, K.; Simmer, C. Trends in Water Level and Flooding in Dhaka, Bangladesh and Their Impact on Mortality. *Int. J. Environ. Res. Public Health* 2015, 12, 1196-1215.