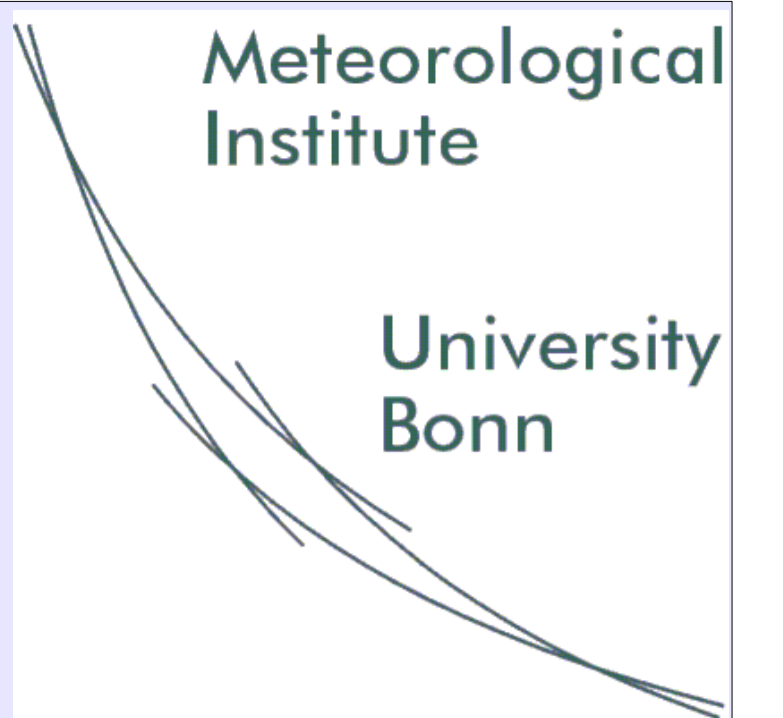


Department of Geography
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Natural hazards and climate change in Dhaka: future trends, social adaptation and informal dynamics

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Like many megacities in the world, Dhaka is regularly threatened by natural hazards. Risks associated with floods and cyclones in particular are expected to increase in the years to come because of global climate change and rapid urbanization. Greater Dhaka is expected to grow from 13.5 million inhabitants in 2007 to 22 million inhabitants by 2025.



The vast majority of this growth will take place in informal settlements. Due to the setting of Greater Dhaka in a deltaic plain, the sprawl of slums is primarily taking place in wetlands, swamps and other flood-prone areas. Slum dwellers and informal businesses are vulnerable, but have somehow learned to cope with seasonal floods and developed specific adaptation strategies. An increase of precipitation extremes and tropical cyclones, however, will put considerable stress on the adaptability of the social and economic system. DhakaHazard, a joint research project run by the Meteorological Institute at the University Bonn and the Department of Geography at the University of Cologne, takes up these issues.



Main objective 1: To link analyses of informal social and economic adaptation strategies to models on future climate change and weather extremes.

Main objective 2: To estimate more accurately the future frequency and magnitude of weather extremes and floods which are crucial for the adaptability of informal systems.

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Specific objectives:

1. Identifying adaptation and recovery strategies of slum dwellers and informal businesses, e.g. brickfields and tanneries.
2. Analyzing the vulnerability and resilience of economic and social systems within high-risk areas.
3. Analyzing the role of social capital as well as formal and informal institutions for building up resilience.
4. Analyzing possibilities and limits of adaptation strategies under conditions of further urban growth and climate change (possible increase in frequency and magnitude of floods and cyclones).

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Specific objectives:

1. Identifying global and regional weather conditions resulting in flooding of the Greater Dhaka region.
2. Analyzing possible variations in flood-inducing weather patterns by evaluating their frequency and magnitude.
3. Developing a prediction method for the spatial patterns of flooding within the Dhaka area.
4. Analyzing the potential of making better use of weather predictions to mitigate weather-related risks for Greater Dhaka.
5. Including the behavioral patterns of the informal sector in the development of a meteorological early warning system.

Collecting information and data, building up research co-operations

1. funding period (2008-2010)

Analyzing adaptation strategies and resilience of households and informal businesses

Methods:

Quantitative household and business surveys
Semi-structured interviews with selected households and businesses
Qualitative expert interviews

Kick-off workshop with partners and related experts in Dhaka in February 2009

2nd workshop with partners and related experts in Dhaka in February 2010; discussion of first results

Investigation of frequency, magnitude and trends of extreme weather events and their relation to Dhaka floods

Methods:

Employing reanalysis data, trends in magnitude and frequency of weather extremes will be evaluated. Subsequently, statistical correlations between flood characteristics in the Greater Dhaka region and meteorological conditions will be analyzed. Findings are then applied to future global climate scenario runs to obtain a first estimate of trends for the frequency and magnitude of weather extremes and their impact on spatial and temporal characteristics of floods in the Greater Dhaka region.

2. funding period (2010-2012)

Analyzing future adaptability and its limits under the conditions of climate change

Methods:

Semi-structured interviews with selected households and businesses
Qualitative expert interviews

Workshop with local actors and partners, presenting meteorological modelling

Refined analysis of the future extreme weather and flood threats and design of effective warning procedures

Methods:

Findings of the first funding period are further analyzed by a dynamical downscaling of the global scenario runs using the community regional climate model COSMO-CLM.

Fulfilling main objectives