



The Research Group

Physical Geography

has the honor to invite you to the public defense of the PhD thesis of

## Mohammad Abdul Quader

to obtain the degree of Doctor of Sciences

Title of the PhD thesis:  
Assessing the spatial variation of risk from coastal hazards and risk reduction strategies along the coast of Bangladesh

Promotor:

Prof. dr. Matthieu Kervyn (VUB)

Prof. dr. A.M.M. Amanat Ullah Khan (Dhaka University)

The defense will take place on  
**Thursday, April 28, 2022 at 16:00** in  
auditorium D.2.01

Zoom link (for those who will be online)

<https://us02web.zoom.us/j/83098530318?pwd=QWVTU0Zpb3pDcStsRDVXenVzNGtSUT09>

### Members of the jury

Prof. dr. Frank Canters (VUB, chair)

Prof. dr. Bas van Heur (VUB, secretary)

Prof. dr. Marijke Huysmans (VUB)

Prof. dr. Sabine Henry (Université de Namur)

Prof. dr. Bimal Kanti Paul (Kansas State University)

### Curriculum vitae

Mohammad Abdul Quader holds bachelor and MSc in Geography from Dhaka University (Bangladesh) and a MSc in Physical Land Resources from Ghent University and VUB. Mr. Quader benefited from a VLIR-UOS ICP PhD scholarship for his research in the department of Geography, VUB. He has published two scientific articles from his PhD research in international peer reviewed journals. He has supervised several bachelor's and master's thesis students. His research interest is in natural hazard and disaster management in the context of climate change.

### Abstract of the PhD research

The coastal area of Bangladesh is exposed to multiple natural hazards. They regularly affect the coast, as demonstrated by the devastating cyclones in 1970, 1991, 2007, 2009 and 2020. Over the last decades, Bangladesh has shifted its paradigm from post-disaster relief distribution to disaster risk reduction (DRR). DRR comprises three aspects: science (i.e., risk assessment), policy (i.e., legal framework, and regulations) and actions (i.e., implementation and evaluation).

This study aims to characterize a) the spatial distribution of risk to coastal hazards of Bangladesh; b) the factors controlling household risk associated with multiple coastal hazards; c) the factors controlling evacuation behaviour to cyclones; and d) the efficiency of the government's policies for risk reduction measures.

In this thesis, risk from coastal hazards are assessed at the at regional scale and at household scale. Three offshore islands and three mainland administrative units have been chosen as case studies from the three sections of coast of Bangladesh for risk assessment at local scale. A survey of 609 households and 12 focus group discussions (FGDs) were used. To understand factors influencing evacuation order compliance, a questionnaire survey of 108 families and four FGDs were conducted in two unions on the western coast.

Vulnerable populations and high exposed areas are found to be distributed along the land-sea boundaries, major rivers and on islands. Islands and the central coast are found more vulnerable in the local risk assessment. Evacuation decisions are positively influenced by good quality roads and negatively influenced by the perceived poor conditions of cyclone shelters. This thesis identified well-established links among the different institutions in charge of risk management acting at local level, although lack of resources and poor linkage with other institutions at other administrative levels are also highlighted.

In addition to index-based risk assessment at two spatial scales, this thesis provides evidence-based risk assessment that contribute to inform policy makers in planning and implementing DRR strategies.