PhD Realistic computational models of behavior in cascading disasters (1.0 FTE) (V23.0774)

Job description

There has been a significant change in the risk landscape in recent years. Climate change is only one of the many factors that increase the likelihood and magnitude of extreme events, triggering compound disasters with unforeseeable consequences. A single disaster such as an unexpected flood can turn into a cascading event if an earthquake happens, causing disruptions in communicative networks, unclear evacuation behaviors and resulting in road congestion and further accidents. To improve preparedness for, and management of, cascading disasters it is necessary to adopt a systemic risk approach, because human decisions are embedded and shaped by the physical and the social context.

This project: Realistic computational models of human behavior in cascading disasters: Agent-based models and citizen science to enhance disaster risk preparedness in Groningen" shows its inter- and trans-disciplinary nature. The project will combine computational models and citizen science approaches to develop a set of agent-based simulations of a cascading disaster and its consequences for the province of Groningen.
The aim of this inter- and transdisciplinary project is to investigate disaster preparedness by means of a simulation model of behavioral preparedness and emergency management in the case of a cascading disaster. The province of Groningen, due to its existing vulnerabilities, offers an instructive case study to model the combination of a major earthquake and a dyke failure. The project will be interdisciplinary (integrating theories from analytical sociology, cognitive psychology and citizen science), multi-method (agent-based modeling and citizen science) and transdisciplinary (adopting a problem-centered approach that allows citizens, first responders and policy makers to contribute to the development of the project).
This project is part of an interdisciplinary collaboration between Sociology, Complexity science and Agent-Based modeling.

The supervisory team is composed of: Dr. Wander Jager, University College Groningen, Promoter;
Prof. Andreas Flache, Sociology, Promoter; Dr. Francesca Giardini, Faculty of Behavioral and Social Sciences, and Dr. Mohammad Gharesifard, Faculty of Science and Engineering, Supervisors.

The tasks of the PhD candidate are:
- conduct research that results in a dissertation and is in line with the objectives and requirements of the project
- organize and execute the data collection for the different studies
- publish the results of the research in international scientific journals
- present the research findings to fellow scientists and developers in the larger project, and collaborate with them
- provide a limited number of educational activities at the Sociology department.