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Holistic stakeholder-oriented and case study-based risk analysis

Tobias Heisterkamp
Institute of Meteorology, Freie Universität Berlin, Berlin, Germany (tobias_heisterkamp@gmx.de)

Case studies of storm events in the Berlin conurbation demonstrate the chance of a holistic approach and its potential data sources. Data sets of population, but also data provided by insurance and transport companies, and operating data provided by fire brigades, are used. Various indicators for risk analysis are constructed to identify hot spots. These hot spots can be shortcomings or critical aspects in structure, communication, the warning chain, or even in the structure of potentially affected stakeholders or in the civil protection system itself.
Due to increasing complexity of interactions and interdependencies in or between societies and nature, it is important to choose a holistic approach. For risk analyses like the storms in Berlin, it captures many important factors with their effects.
For risk analyses, it is important to take potential users into concern: The analysis gets important due to its use later on. In addition to a theoretical background, a focus on the application should be set from the beginning on. To get usable results, it is helpful to complement the theoretical meta-level by a stakeholder-oriented level. An iterative investigation and combination of different layers for the risk analysis explores important influencing factors and allows a tailoring of results to different stakeholder groups. Layers are indicators, gained from data sets like losses from insurance data. Tailoring is important, because of different requirements e.g. by technical or medical assistance. Stakeholders' feedback in the iterative investigation also shows structural limitations for later applications, like special laws the fire brigades have to deal with.
Additionally, using actors' perspectives offers the chance to convince practitioners of taking part in the analysis. Their participation is an essential component in applied science. They are important data suppliers, whose goodwill is needed to ensure good results. Based on their experience, they can also help by evaluating the results and their correspondence to reality continuously.
Using case studies can help to identify important stakeholders, notably potential affected groups. To cover essential interests of all important stakeholders, a wide range of vulnerabilities, regarding physical and social aspects, and including their resiliences, has to be assessed. The case studies of storm events offer a solid base for investigations, no matter which method is used. They expose shortcomings like gaps in the warning chain or misunderstandings in warning communication. Case studies of extreme events are very interesting for many stakeholders, insurances or fire brigades use them in their daily work. Thus a case study-based approach is a further chance to integrated practitioners into the analysis process and to get results, which they easily understand and which they can transfer into application.
There could a second advantage in taking many data sets into account: Each data set like the meteorological observations of wind gust speeds has inherent shortcomings like limited expressiveness, significance or especially uncertainties. Using various approaches could frame the final result and prevent expanding biases or misinterpretations.
Altogether, this work stresses the role of transdisciplinary holistic approaches in vulnerability assessments for risk analyses.