Summary

Hurricane Katrina, the Indian Ocean tsunami, the crash of Lehman brothers and the 9/11 terrorist attacks are but recent examples of events that have raised questions about our ability to anticipate, and make sense of, disaster risk. However, in hindsight, we easily forget that there always are an infinite number of potential scenarios ahead of us, but only one past, which makes us exaggerate the predictability of events once they have occurred. We may also neglect a number of structural and psychological barriers that, effectively, could obstruct the quest to comprehend the hazards we face.

This thesis focuses on the possibility of understanding disaster risk. Such understanding requires exchange of information between a large number of heterogeneous stakeholders (e.g., public authorities, private companies, and interest groups). Exchanging information is not enough, however; the information must also be integrated in a way that supports holistic decisions concerning which risks we address and how. The way in which this is done is not only decisive for our ability to make cost efficient allocations of limited resources; it also affects the types and magnitude of the consequences that future disasters may bring about.

Using Sweden as an example, this thesis explores what aggregating disaster risk information from multiple stakeholders entails in terms of activities, as well as the challenges involved in trying to do it. The thesis also probes the causes and effects of these challenges, as well as possible means to overcome them. The findings are derived from a mix of theoretical studies and interactions with risk management professionals at all administrative levels in Sweden (e.g., literature reviews, content analyses, experiments, interviews, and workshops).

In the thesis, aggregation is understood as comprising the processes of collecting and synthesizing disaster risk information from different actors (a definition reflecting this conception is also suggested). Aggregation also relates to the processes of disseminating the synthesized results (else the purpose of aggregation will not be fulfilled) and providing feedback on information one has obtained from other actors (as a means of improving the chances of aggregating information in times to come).

A prerequisite for being able to aggregate disaster risk information in an efficient way is to know which information one needs and where to find it. This requires knowledge of one's dependencies on external actors, as well as of the direct and indirect effects of a vast range of potential societal perturbations. Attaining such awareness is complicated by the fact that modern welfare states are based on high degrees of specialization and diffusion of responsibilities, with interdependencies between different societal functions increasing and being subject to constant change. Even *with* this knowledge, inter-organizational risk communication may be hindered by the need to conceal sensitive information, competition for resources, inadequate dialogue between public and private stakeholders, and costs in terms of time, energy, and money.

Aside from these challenges associated with assembling data, additional challenges arise when trying to make sense of the material one manages to obtain. In Sweden, all local municipalities, regional county boards, and a number of national authorities, are obliged by law to conduct and communicate the results of risk and vulnerability assessments (RVA) to each other. A study of more

than 120 reports from such assessments showed large discrepancies regarding how these actors analyze and present risk information. Apart from inhibiting the chances of comparing and synthesizing information, this also creates frustration and resignation amongst risk managers at public authorities, which ultimately may lead to a decreased willingness to use others' data. This scenario is likely to have a detrimental effect on the ability to identify risk, analysing it, and implement suitable risk-reducing measures. Yet, opportunities exist to improve the situation.

Experiments in this thesis strongly suggest that aggregation is facilitated when different actors use the same scales and quantitative units (frequencies, numbers, volumes, areas) when expressing risk as well as supplement their assessments with transparent motivations. Additional measures to this end include promoting trust and partnerships between public and private stakeholders through joint workshops, exercises, and trainings (on the management of sensitive information in particular), and developing common and dimensioning risk scenarios that are applicable to authorities at all administrative levels. Current RVA regulations could also be sharpened by including common consequence dimensions, as well as scales and indicators for assessing the likelihood and consequences of risk scenarios. Moreover, it is suggested to elaborate a common template for conveying the main messages from RVA reports and a checklist to stimulate feedback on inter-organizational risk communication. To reduce the time and cognitive load of processing vast amounts of data, future research should look into the possibilities of making better use of visual aids, including how Geographical Information Systems (GIS) can be applied to support the production of individual RVAs and syntheses of their outputs.

It is important that measures to enhance the possibility of aggregating disaster risk information from multiple stakeholders do not curb their sense of ownership or motivation to produce risk assessments. For this reason, it is argued that initiatives in this field need to be based on a combination of top-down and bottom-up approaches, where central guidelines and directives are negotiated with the stakeholders that are meant to abide by them, and the substance of risk assessments primarily stems from the actors closest to the objects and systems that are being assessed. In this way, comparable risk information may retain the quality needed to make cost-efficient decisions in support of societal safety.