

# Inclusive Resilience: A New Approach to Risk Governance<sup>i</sup>

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## Introduction

The concept of resilience has been used in many disciplines for different notions of being able to respond adequately when the system is under stress. It has been widely applied in ecological research and denotes the resistance of natural ecosystems to cope with stressors (Holling, 1973; Walker et al., 2004). Resilience is focused on the ability and capacity of systems to resist shocks and to have the capability to deal and recover from threatening events (Carpenter et al., 2001; Rose, 2007). This idea of resistance and recovery can also be applied to social systems (Review in Norris et al., 2007; Adger et al., 2005; Renn & Klinke 2014).

The main emphasis here is on organizational learning and institutional preparedness to cope with stress and disaster. The US Department of Homeland Security (DHS) uses this definition: “Resilience is the ability of systems, infrastructures, government, business, and citizenry to resist, absorb, and recover from or adapt to an adverse occurrence that may cause harm, destruction, or loss [that is] of national significance” (cited after Longstaff et al., 2010: 19). Hutter (2011) added to this analysis the ability of systems to respond flexibly and effectively when a system is under high stress from an unexpected crisis. Pulling from an interdisciplinary body of theoretical and policy-oriented literature, Longstaff et al. (2010) regard resilience as a function of resource robustness and adaptive capacity.

The governance framework suggested by the International Risk Governance Council (IRGC, 2005) depicts resilience as a normative goal for risk management systems to deal with highly uncertain events or processes (surprises). It is seen as a property of risk-absorbing systems to withstand stress (objective resilience) but also the confidence of risk management actors to be able to master crisis situations (subjective resilience).

In this paper, I explain the connection between inclusiveness of risk governance based on the involvement of multiple stakeholders, and the need to enhance resilience, understood here as the capability of a socio-technical system to cope with events that are uncertain and ambiguous (Klinke & Renn, 2012). This approach has been inspired by Lorenz (2010), who distinguishes adaptive, coping and participative aspects of resilience. I will use this classification to discern between three management styles which correspond to these three aspects of resilience. I have called them: risk-

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informed (corresponding to adaptive capability); precaution-based (corresponding to coping capability) and discourse-based (corresponding to participative capability).

### Complexity, uncertainty and ambiguity in risk governance

Understanding and managing risks are confronted with three major challenges: complexity, uncertainty and ambiguity (Renn & Klinke, 2016; Rosa et al., 2014: 130ff). Complexity refers to the difficulty of identifying and quantifying causal links between a multitude of potential candidates and specific adverse effects. Uncertainty denotes the inability to provide accurate and precise quantitative assessments between a causing agent and an effect. Finally, ambiguity denotes either the variability of (legitimate) interpretations based on identical observations or data assessments or the variability of normative implications for risk evaluation (judgment on tolerability or acceptability of a given risk).

In a case where scientific complexity is high and uncertainty and ambiguity are low, the challenge is to invite experts to deliberate with risk managers to understand complexity. Understanding the risks of oil platforms may be a good example of this. Although the technology is highly complex and many interacting devices lead to multiple accident scenarios most possible pathways to a major accident can be modelled well in advance. The major challenge is to determine the limit to which one is willing to invest in resilience.

The second route concerns risk problems that are characterized by high uncertainty but low ambiguity. Expanded knowledge acquisition may help to reduce uncertainty. If, however, uncertainty cannot be reduced (or only reduced in the long run) by additional knowledge, a “precaution-based risk management” is required. Precaution-based risk management explores a variety of options: containment, diversification, monitoring, and substitution. The focal point here is to find an adequate and fair balance between over cautiousness and insufficient caution. This argues for a reflective process involving stakeholders to ponder concerns, economic budgeting, and social evaluations.

For risk problems that are highly ambiguous (regardless of whether they are low or high on uncertainty and complexity), route 3 recommends a “discourse-based management.” Discourse management requires a participatory process involving stakeholders, especially the affected public. The aim of such a process is to produce a collective understanding among all stakeholders and the affected public about how to interpret the situation and how to design procedures for collectively justifying binding decisions on acceptability and tolerability that are considered legitimate. In such situations, the task of risk managers is to create a condition where those who believe that the risk is worth taking and those who believe otherwise are willing to respect each other’s views and to construct and create strategies acceptable to the various stakeholders and interests.

In essence: The effectiveness and legitimacy of the risk governance process depend on the capability of management agencies to resolve complexity, characterize uncertainty and handle ambiguity by means of communication and deliberation.

### Instrumental processing involving governmental actors

Dealing with linear risk issues, which are associated with low scores for complexity, scientific uncertainty and socio-political ambiguity, requires hardly any changes to conventional public policy-making. The data and information regarding such linear (routine) risk problems are provided by statistical analysis; law or statutory requirements determine the general and specific objectives; and the role of public policy is to ensure that all necessary safety and control measures are implemented and enforced (Klinke & Renn, 2012). Traditional cost-benefit analyses, including effectiveness and efficiency criteria, are the instruments of political choice for finding the right balance between under- and over-regulation of risk-related activities and goods. In addition, monitoring the area is important to help prevent unexpected consequences. For this reason, linear risk issues can well be handled by departmental and agency staff and enforcement personnel of state-run governance institutions. The aim is to find the most cost-effective method for the desired regulation level. If necessary, stakeholders may be included in the deliberations as they have information and know-how that may help to make the measures more efficient.

### Epistemic processing involving experts

Resolving complex risk problems requires dialogue and deliberation among experts. The main goal is to scan and review existing knowledge about the causal connections between an agent and potential consequences, to characterize the uncertainty of this relationship and to explore the evidence that supports these inferences. Involving members of various epistemic communities which demonstrate expertise and competence is the most promising step for producing more reliable and valid judgments about the complex nature of a given risk. Epistemic discourse is the instrument for discussing the conclusiveness and validity of cause-effect chains relying on available probative facts, uncertain knowledge and experience that can be tested for empirical traceability and consistency. The objective of such a deliberation is to find the most cogent description and explanation of the phenomenological complexity in question as well as a clarification of dissenting views (for example, by addressing the question which environmental and socio-economic impacts are to be expected, in which areas and in what time frame). The deliberation among experts might generate a profile of the complexity of the given risk issue on selected inter-subjectively chosen criteria. The deliberation may also reveal that there is more uncertainty and ambiguity hidden in the case than the initial appraisers had anticipated (Birkmann, 2011; Bovenkerk, 2012). It is advisable to include natural as well as social scientists in the epistemic discourse so that potential problems with risk perception and risk frames can be anticipated. Controversies would then be less of a surprise than is currently the case. Such epistemic discourse is meant to lead to adaptive management procedures that monitor the state of knowledge and proficiency in the field and adjust management responses according to the various levels of knowledge available at each time period (Wiering & Arts, 2006; Klinke & Renn, 2012).

### Reflective processing involving stakeholders

Characterizing and evaluating risks as well as developing and selecting appropriate management options for risk reduction and control in situations of high uncertainty poses particular challenges. How can risk managers characterize and evaluate the severity of a risk problem when the potential damage and its probability are unknown or highly uncertain? Scientific input is, therefore, only the

first step in a series of steps constituting a more sophisticated evaluation process. It is crucial to compile the relevant data and information about the different types of uncertainties to inform the process of risk characterization. The outcome of the risk characterization process provides the foundation for a broader deliberative arena, in which not only policymakers and scientists, but also directly affected stakeholders and public interest groups ought to be involved in order to discuss and ponder the 'right' balances and trade-offs between over- and under-protection (Renn & Schweizer, 2009). This reflective involvement of stakeholders and interest groups pursues the purpose of finding a consensus on the extra margin of safety that potential victims would be willing to tolerate and potential beneficiaries of the risk would be willing to invest in to avoid potentially critical and catastrophic consequences. If too much precaution is applied, innovations may be impeded or even eliminated; if too little precaution is applied, society may experience the occurrence of undesired consequences. The crucial question here is how much uncertainty and ignorance the main stakeholders and public interest groups are willing to accept or tolerate in exchange for some potential benefit.

This issue has direct implications for resilience. As this concept reflects the confidence of all actors to deal with even uncertain outcomes, it provides a mental guideline for the negotiations between beneficiaries and potential victims of risks (IRGC, 2005). Furthermore, it includes a discourse about coping capacity and compensation schemes if the worst were to happen. The boundary between subjective and objective resilience is, however, fuzzy under the condition of effect uncertainty (Brown & Kulig, 1996/97; Norris et al., 2007). In cases of known risks past experience can demonstrate whether the degree of self-confidence was accurate and justified. Over long time spans one would expect an emerging congruence between objective and subjective resilience (learning by trial and error). However, for extremely rare events or highly uncertain outcomes, one necessarily relies on models of anticipation and expectations that will widely vary among different stakeholder groups, in particular those who benefit and those who will bear the risks (Berkes, 2007). Furthermore, there will be lots of debates about the potential distribution of effects over time and space. The degree of coping capacity that is regarded as sufficient or justified for approving a new risk agent or a disaster management plan to become enacted depends therefore on a discourse between the directly affected groups of the population. Such a reflective involvement of policymakers, scientists, stakeholders and public interest groups can be accomplished through a spectrum of different procedures such as negotiated rule-making, mediation, round-table or open forums, advisory committees, and others (see Beierle & Cayford, 2002; Klinke, 2006; Rowe & Frewer, 2000; Stoll-Kleemann & Welp, 2006).

### Participative processing involving the wider public

If risk problems are associated with high ambiguity, it is not enough to demonstrate that risk regulation addresses the public concerns of those directly affected by the impacts of the risk source. In these cases, the process of evaluation and management needs to be open to public input and new forms of deliberation. This corresponds with the participative aspect of resilience (Lorenz, 2010). Such discursive activities should start with revisiting the question of proper framing. Is the issue really a risk problem or is it an issue of lifestyle or future vision? Often the benefits are contested as well as the risks. The debate about 'designer babies' may illustrate the point that observers may be concerned not only about the social risks of intervening in the genetic code of humans but also about

the acceptability of the desired goal to improve the performance of individuals (Hudson, 2006). Thus, the controversy is often much broader than dealing with the direct risks only. The aim here is to find an overlapping consensus on the dimensions of ambiguity that need to be addressed in comparing risks and benefits, and balancing pros and cons. High ambiguity would require the most inclusive strategy for involvement because not only directly affected groups but also those indirectly affected should have an opportunity to contribute to this debate.

Resolving ambiguities in risk debates necessitates the participatory involvement of the public to openly discuss competing arguments, beliefs and values. Participatory involvement offers opportunities to resolve conflicting expectations through a process of identifying overarching common values, and to define options that will allow a desirable lifestyle without compromising the vision of others. Critical to success here is the establishment of equitable and just distribution rules when it comes to common resources and a common understanding of the scope, size and range of the problem, as well as the options for dealing with the problem (Renn & Schweizer, 2009). Unless there is some agreement on the boundaries of what is included, there is hardly any chance for a common solution. Such a common agreement will touch upon the coping capacity of systems to deal with different frames of risks and not only with the physical impacts of risks. There are various social constructions of resilience that the participants associate with the management options. The set of possible procedures for involving the public includes citizen panels or juries, citizen forums, consensus conferences, public advisory committees and similar approaches (see Rowe & Frewer, 2000; Beierle & Cayford, 2002; Hagendijk & Irwin, 2006; Klinke, 2006; Abels, 2007; Renn, 2008: 284ff.).

## Conclusions

The goal of this paper has been to illustrate the significance of resilience for risk governance, including all stages from pre-assessment to management and communication. For this purpose, the resilience concept by Lorenz was applied to link risk governance strategies with the three major aspects of resilience: adaptive management capacity, coping capacity, and participative capacity. The three risk characteristics –complexity, uncertainty and ambiguity– were linked to these three aspects of resilience. Furthermore, the three aspects were used to develop four major risk management and discourse strategies; beginning with simple risk management in which none of these characteristics and capacity requirements were involved, to discourse-based management in which all three characteristics and capacity requirements were combined.

Whereas the analysis of simple and –to some degree– complex problems is better served by relying on the physical understanding of experienced resilience, uncertain and ambiguous problems demand the integration of social constructions and mental models of resilience, operationalized as confidence in one's coping capacity, for both understanding and managing these problems. The distinction of risks according to risk characteristics not only highlights deficits in our knowledge concerning a risk issue, but also points the way forward for the selection of the appropriate management options. Thus, the risk governance framework attributes an important function to public and stakeholder participation, as well as risk communication, in the risk governance process. The framework suggests efficient and adequate public or stakeholder participation procedures. The concerns of stakeholders and/or the public are integrated into the risk appraisal phase via concern assessment. Furthermore, stakeholder and public participation are an established part of risk management. The optimum

participation method depends on the characteristics of the risk issue. In this respect, the three aspects of resilience are gradually included into the various discourses. The need for finding an agreement on what constitutes an adaptive, coping and participative response to ensuring resilience underlines the necessity to understand and comprehend the objective and subjective nature of resilience.

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