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74. A functional risk society? Progressing from management to governance while learning from disasters

by
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The intensive use of technology, accelerated urbanisation, and use of natural resources and ecosystems services that disregard the dynamics of extreme natural processes are leading to recurrent and increasingly costly disasters. These need to be understood as the result of past decisions combining multiple interests, the consequences of exposure in hazard-prone areas, and of vulnerability in human settlements and activity. The concept of risk society provides a framework for understanding the complex links between contemporary society and risk.

Risk as change

Change is intrinsic to human and natural systems. However, its occurrence is confusing when hazards suddenly alter everyday life and business, and demand further adjustment in behaviour. Such new conditions are the effect of past human actions, recent or ancient, of processes in the natural environment, or a combination of both. Slow change allows for gradual adaptation. However, when change is abrupt, the social structure and production system do not adapt easily, particularly when such events do not occur frequently, because memory decays and risk perception weakens. However, policy leaps may occur.

This change is better understood in the context of socio-ecological systems (Berkes and Folke, 1998), where the bidirectional and complex interactions between human and natural systems are recognised. This approach acknowledges that society cannot develop in isolation without considering the limits that the natural environment defines or the diversity of exchanges.

Risk society

The increasing exposure of populations, urban areas, economic activity, food systems and infrastructures to rapid or slow-onset environmental processes leads to risk playing an increasing role in daily life, as does the emergence of new risks caused by the endless

development of advanced technologies. This led to the notion of risk society (Beck, 1992). Not surprisingly, human development commonly leads to an increasing risk from technological hazards and higher economic costs of disasters.

Every disaster brings losses but also gains. Particularly notable is the improved understanding of the processes involved. This advances our awareness of the interactions between human and ecological systems, and the effects of past decision-making processes. Ultimately, it allows us to examine how risk society unfolds. Table 74.1 describes the knowledge and awareness gained after different kinds of major global events in the 20th and early 21st centuries. Each learning has been translated to risk theory, but apparently not sufficiently transferred to policy-making practice.

Table 74.1. **Principal lessons from major selected disasters**

Major event[1]	Nature of learning
Kobe earthquake 1995	Megacities are highly vulnerable and develop mega-risks in some hotspots. The loss is predominantly economic in developed regions.
Indian Ocean tsunami 2004	Disasters in less-developed regions claim high losses in human lives. Monitoring is critical to activate early warning and to avoid major losses.
Hurricane Katrina, New Orleans 2005	Certain cities have a reduced range of options for mitigation and thus need to better adapt and develop better resilience.
Haiti earthquake 2010	Weak governance in poor countries and cities leads to an absolute lack of response capacity and diminished resilience after major disasters.
Black Saturday bushfires, Australia 2009 California wildfires 2007-10	The interface between cities and rural areas has become blurred by urban sprawl. This increases the vulnerability of suburbs in particular and urban areas in general.
European heatwave 2003	Silent low-onset disasters are difficult to identify, monitor and address, and may cause a very large number of victims.
Influenza pandemic 1918	Pandemics are one of the most threatening natural hazards on a global scale.
Influenza pandemic 2009	The risk perception of different social groups differs. While the precautionary principle is a useful instrument to deal with uncertainty, it may lead to decision-makers over-reacting.
San Francisco earthquake and fire 1906 Tōhoku tsunami and Fukushima nuclear accident 2011	The interaction between the natural and technological dimensions of disasters seems to be apparent when they develop into complex natural and technological disasters.
Chernobyl disaster 1986	Mismanagement of technology may lead to critical failures and threaten the survival of humans.
Ozone-depleting substances, since mid-20th century	Generalised and diffuse use of a technology may lead to dramatic changes in the global environment. The Montreal Protocol (1989) is an example of the successful governance of a global risk.

1. From natural to technological disasters.

The knowns and unknowns

Uncertainty is the lack of reliability and validity in the causal relationships between the agent and the effect (Renn, 2008). It is also an inherent property of risk. This is due to the elusive spatial or temporal dimensions of all types of hazard, despite past monitoring and the fragmentary understanding it has yielded. But it is also due to the unpredictable consequences of any event. In some instances, we can estimate some dimensions – such as the spatial pattern or the time frame – but we cannot anticipate the timing of a specific hazardous event. In other instances – such as earthquakes – we are unable to forecast at all. Managing known knowns seems straightforward, but societies have to deal with recognised known unknowns, intangible unknown unknowns, and even concealed unknown knowns (Zizek, 2008). Do societies have appropriate policy instruments to confront risks by adopting integrated and adaptive strategies? Probably not. Current risk governance usually

tackles the first two types, but for differing reasons of uncertainty or choice, has made little progress in dealing with the last two.

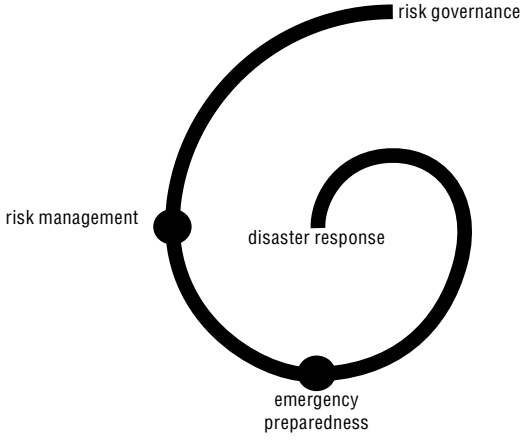
Risk governance as an unfolding approach

Various approaches have been developed to deal with uncertainty. Disaster response provides a very limited level of certainty, since it involves community action that only manages to relieve the impact of disaster and facilitate return to normal life. The possible recurrence of disasters is usually disregarded during recovery. Further, emergency management policy anticipates the unknown by focusing its planning on prior and ulterior actions, and by making human and material resources accessible when disaster strikes. But have the specificity of hazards and the nature of vulnerability been considered? Plans have often been hazard-specific, but also redundant. They have not taken the interactions between diverse risks into consideration.

Risk management has addressed these weaknesses through detailed risk analysis and assessment to identify and deal with known knowns and unknowns. The Hyogo Framework for Action (ISDR, 2005) was a major step towards managing risk globally through principles agreed by policymakers, practitioners and experts. It emphasises transition at the local scale, exemplified by the Making Cities Resilient (ISDR, 2010) campaign. But what about the complexity of governing a complete society and its uncertainties?

Risk governance (Renn, 2008) is a conceptual framework that focuses on examining the components, interactions and structure of a decision-making system – and not just that of the government, which excludes social and private actors. This approach may contribute to the conventional governance mode being reformulated. It needs to adapt to continuous social, economic and environmental change. Risk governance should therefore be multi-level, cross-sectoral and participatory to deal with the challenges of a risk society. This evolution towards a greater integration of the interactions and interferences between risk management and other sectoral policies is illustrated in Figure 74.1. But how can risk governance become an operational reality?

Figure 74.1. **The unfolding of risk governance**



Source: U. Fra. Paleo (forthcoming 2013).

Functional risk governance

Risk theories, paradigms and approaches have been developing complementarily or dialectically (for examples, see Table 74.2) since the pioneering study of adjustment to floods by Gilbert F. White (1945), and are increasingly uniting in a new concept. Simultaneously, the social sciences have gained growing relevance with the shift from the early study of hazards to the interest in disasters (see for example Quarantelli, 1998), the development of the notion of vulnerability, and particularly with the formulation of the theory of risk society. The previously dominant paradigm of vulnerability has been replaced by resilience, which is shaping contemporary policy-making (National Academies, 2012). This also illustrates the relentless evolution of the field.

Table 74.2. **Some dialectic approaches in risk governance and convergence**

Approach A	Approach B	Convergent approach
Risks from natural hazards	Risks from technological hazards	Natural and technological risks Socio-ecological systems
Reactive	Proactive	Integrated cycle of risk
Risk aversion	Risk propensity	Societies demonstrate combined or contingency-related attitudes
Command	Co-operate	Participatory governance
Vulnerability	Resilience	Resilience as a component of coping capacity
Mitigation	Adaptation	Mitigation as a human adaptation strategy
Insurance-based	Plan-based	Integrated mode of societal risk transfer

Making separate studies of natural and technological hazards seems an unsuitable approach to examining either the earthquake and urban fire in San Francisco (1906) or the 2011 Tōhoku tsunami and Fukushima nuclear disaster. A comprehensive approach that considers the complex interactions between the natural and the human systems is more appropriate in addressing disaster risk and human development. In particular, spatial planning seems to be the most appropriate comprehensive policy instrument with which to gain influence on exposure to hazards (Fra Paleo, 2009), as it can integrate the social, economic and environmental dimensions.

Accordingly, policy-making should focus on the systemic integration of the different phases of the risk cycle of response–recovery–monitoring–assessment–mitigation–preparedness–response, and not on its individual constituents separately. Simultaneously, citizens and decision-makers' knowledge and interests should be combined (Burby and May, 2009), and incorporated into the processes of policy design and evaluation in order to overcome the persistent implementation gap. This requires the integration of the vertical (levels of government) and the horizontal (sectoral) components; formal and informal norms, institutions and settings; and formal, scientific knowledge with local knowledge.

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