



## **How to avoid the Safe Development Paradox**

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Burby (2006) explains large parts of the damage after hurricane Katrina in New Orleans with the so called safe development paradox. If a levee is built people behind the levee as well as the local officials tend to think that they are now “safe”. Thus, without binding building restrictions the area behind the levee will be developed as if it was really safe. This leads to an increased damage potential which will be realized when the levee is eventually overtopped. This levee effect was first described 1937 by Segoe. Burby (2006) broadens this perspective and explains that every measure which leads to such a false sense of security will lead to higher future damage. For example, Keiler (2004) and Fuchs (2004) showed that danger zone mapping in the Austrian and Swiss Alps leads to the highest growth rate of development directly at the edge of the building ban zone because people know where it is “safe” to build houses according to the danger zone plan. If climate change for example leads to a more severe hazard, the spatial planning system would have helped to increase the damage potential.

The following question will be addressed in this paper: Which combination of structural and non-structural measures helps to reduce risk but also inhibits the increase of damage potential to overcome the safe development paradox. First, all technical measures have to be checked how they react if the danger process is bigger than the design event. Like levees which have no effect if they are breaking or overtopped those structural measures should be avoided which lead to greater or the same damage if they fail. For example, a flash flood at the Lainbach in 1990 destroyed all (!) torrent check dams and mobilized additional bed load. Second, the combination of structural and non structural measures should increase or at least keep constant the awareness of the people at risk and the local representatives. In this regard mobile structures that have to be erected during an event are helpful because people notice the dangerous situation and the necessity of action.

This paper cannot provide a complete answer to the addressed question; rather, I would propose a research agenda with the following two topics:

1. Systematic analysis of failures of structural measures especially for big events.
2. Analysis of new integrated protection concepts regarding not only their technical feasibility but also their impact on public risk perception.

**Burby, Raymond J.**, "Hurricane Katrina and the Paradoxes of Government Disaster Policy: Bringing about Wise Governmental Decisions for Hazardous Areas," *Ann Am Acad Political Social Sci*, 2006, 171-191.

**Keiler, Margareth**, "Development of the Damage Potential resulting from Avalanche Risk in the period 1950–2000, Case Study Galtür," *Natural Hazards and Earth System Sciences*, 2004, 249-256.

**Fuchs, Sven, Bründl, M. and Stötter, J.**, "Development of Avalanche Risk between 1950 and 2000 in the Municipality of Davos, Switzerland," *Natural Hazards and Earth System Sciences*, 2004, 263-275.