

# **Governing Disasters under a changing climate: Challenges, Limitations, Lessons learnt. An Austrian perspective.**



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## Structure

- Setting the scene about natural hazards in Austria
- Risk-governance: success factors in Austria
- Limitations to risk-governance in Austria
- Final remarks and recommendations





# Setting the scene I: Natural Hazards in Austria

- Austria in general exposed to floods, heavy precipitation, thunderstorms, hail and storm; snow avalanches in winter season; extreme events almost every year
- ~ 60% of Austria's territory is mountainous
- only 38% of the land area is available for settlements
- 100.000 km of rivers and creeks, 9.000 lakes
- 67 % of total area part of torrent and avalanche catchments (about 13.000 torrent catchments and nearly 6.000 snow avalanche paths)
- Nearly half of Austria's territory is covered by forests, 30,7 % of forests with protective function, main problem is ageing and lacking regeneration
- Landslides and rock-fall potential an all steep slopes







## Setting the scene II: Risk by Natural Hazards

- In global comparison: Austria is a relatively safe country concerning natural hazards (e.g. no MR Cat. 6 disaster observed in recent decades)
- Major natural disaster: flood 2002 (2.9 billion EUR losses, 9 fatalities)
- Biggest natural disaster in terms of fatalities: snow avalanche season 1689, 256 people died
- ~ every 3 years happens a natural disaster with losses > 200 Mio EUR (VVO – Austria)
- Approx. 400.000 buildings are endangered by natural hazards (incl. floods, avalanches, rockfall)
- Death risk due to natural hazards:
  - Snow avalanches:  $2,10 \times 10^{-4}$  (~ 30 fatalities/yr)
  - Lightning:  $2,00 \times 10^{-6}$
  - Flooding:  $5,00 \times 10^{-7}$
- Economic losses due to weather extremes in the last 20 yr ~ 9.5 billion EUR (Munich Re)

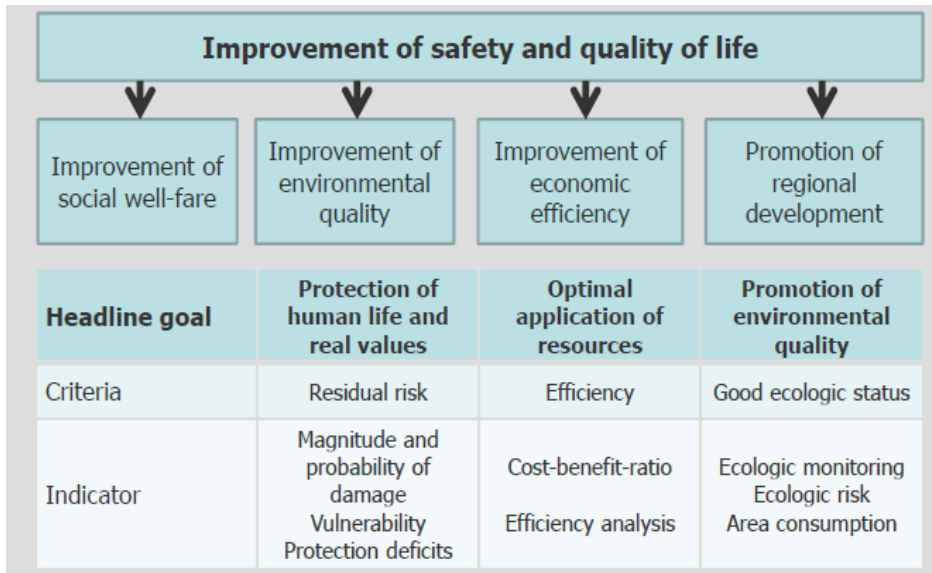


**The need of protection from natural hazards of people living in alpine regions is constantly increasing.**



# Governing natural disasters in AT: success factors (1)

- > Existing national strategy for disaster risk prevention as well as for disaster management, with focus on limiting existing risks for human health, material assets, economic activities and the environment to acceptable levels and to prevent new unacceptable risks by **permanent strategy adjustment** in order to maintain flexibility of all parts of society concerned with natural hazards.



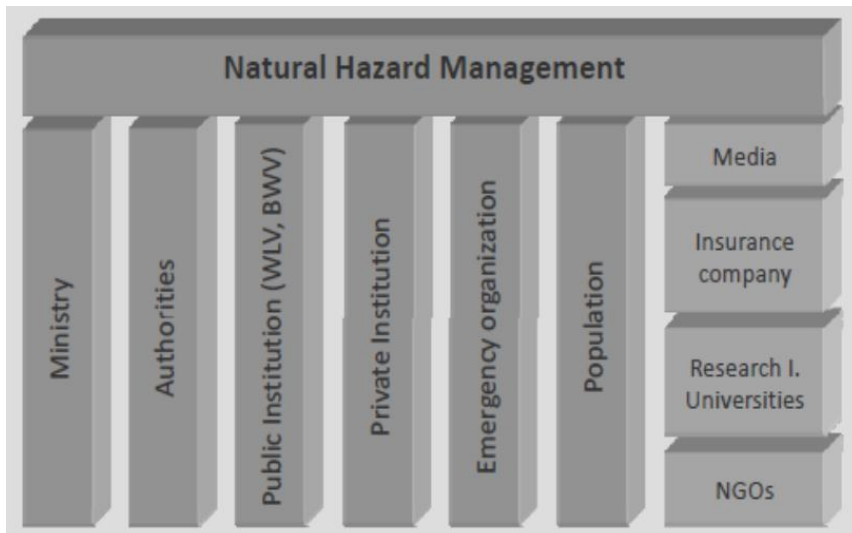
Source: Rudolf-Miklau 2009)





# Governing natural disasters in AT: success factors (2)

- Established effective organisational / institutional structures and task sharing (prevention / contingency / emergency mgt), more than 400.000 volunteers for disaster relief



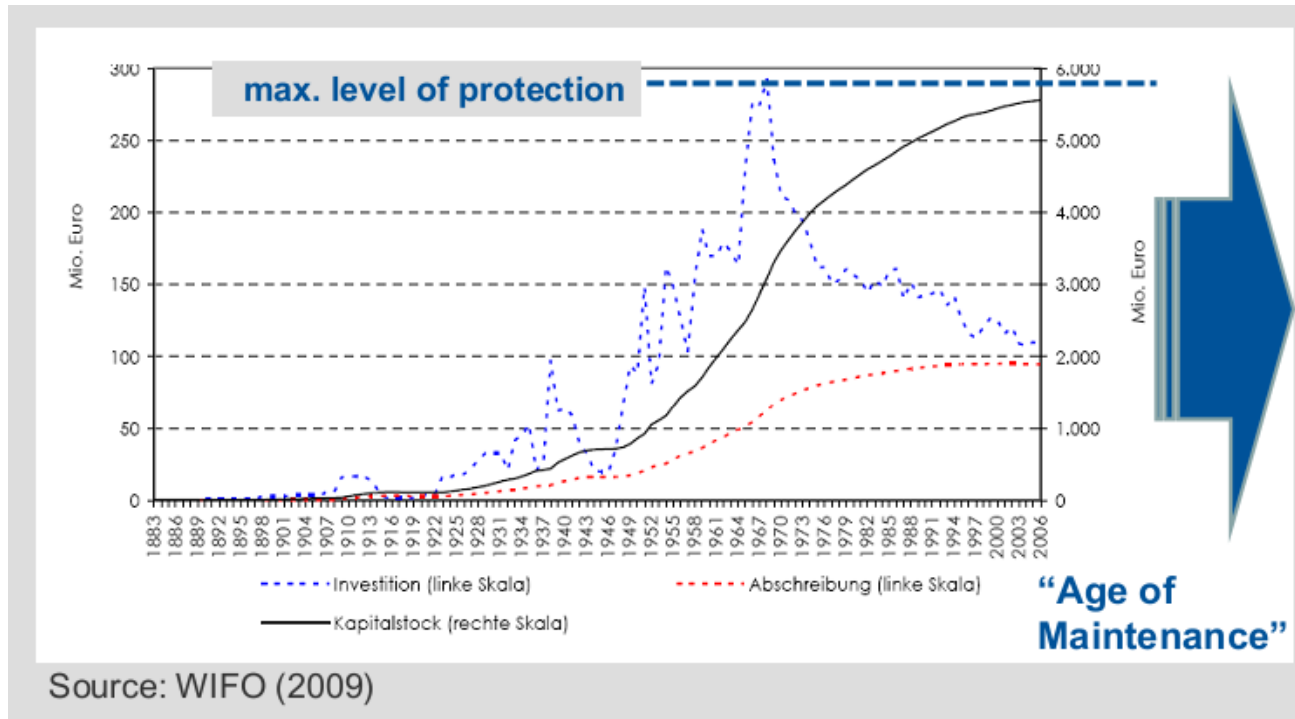
	<b>Competence in Legislation</b>	<b>Competence in Execution</b>
<b>Federal State</b>	Torrent- and Avalanhe Control Flood Control Hydraulic Engineering Funding	Torrent- and Avalanhe Control Hazard Mapping Disaster Relief Fund
<b>Province</b>	Development Planning Building Affairs Disaster Management	Flood Control Supra-local Disaster Management
<b>Community</b> <i>within own domain</i>	---	Land use planning, building Local Disaster Management Avalanche Commissions

Source: Rudolf-Miklau (2009)



# Governing natural disasters in AT: success factors (3)

- > Permanent investment in structural prevention facilities since centuries:  
In Austria, approx. 250.000 structural prevention facilities are in place, representing approx. more than 6 billion EUR (capital stock)



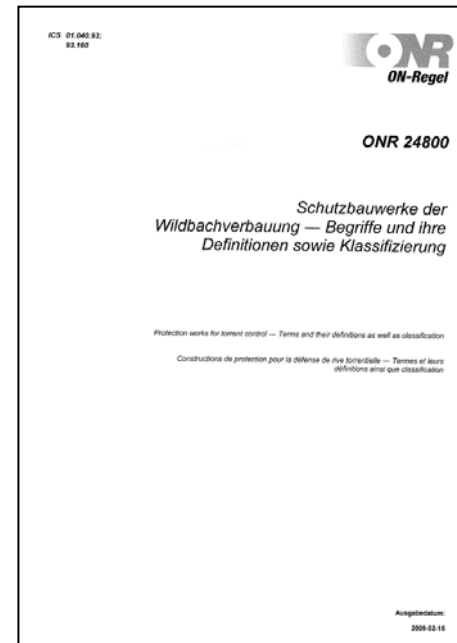


# Governing natural disasters in AT: success factors (4)

> Technical and ecological standards on natural hazard protection and prevention are at the state-of-the-art (or beyond) in Austria: since 2006 “standardisation” of tasks regarding Natural Hazard Management is considered as an key element, especially

- Definitions, classifications ✓
- Construction rules, materials, life cycle ✓
- Products (certification, type test) ✓
- Design (hydrology, hydraulics, statically, geotechnical) ✓
- Impacts, loads, environmental conditions (in preparation)
- Safety concept, structural failures ✓
- Maintenance, monitoring and operability of control structures ✓

> Standards exist for torrent, avalanche and rockfall related tasks

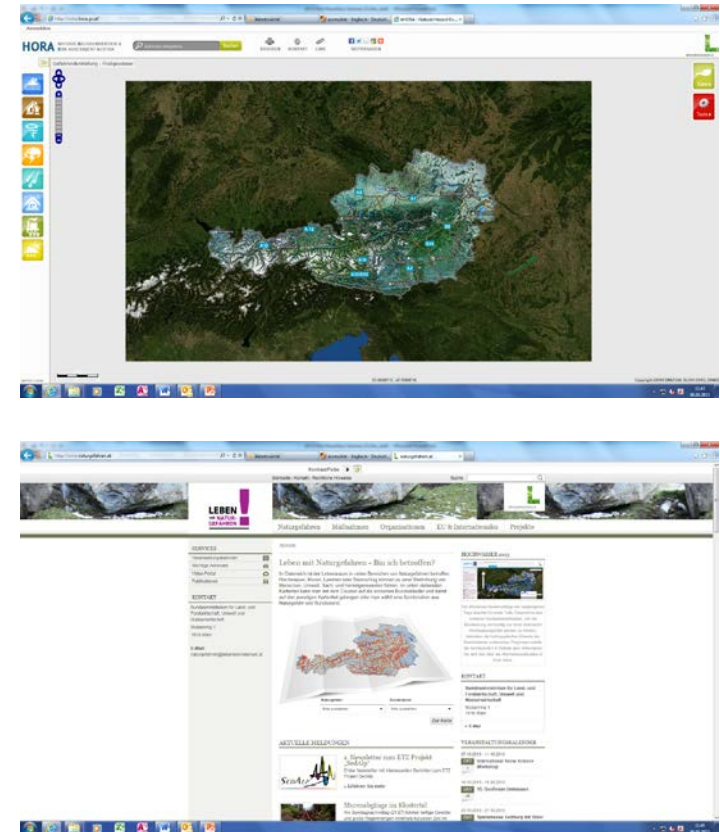
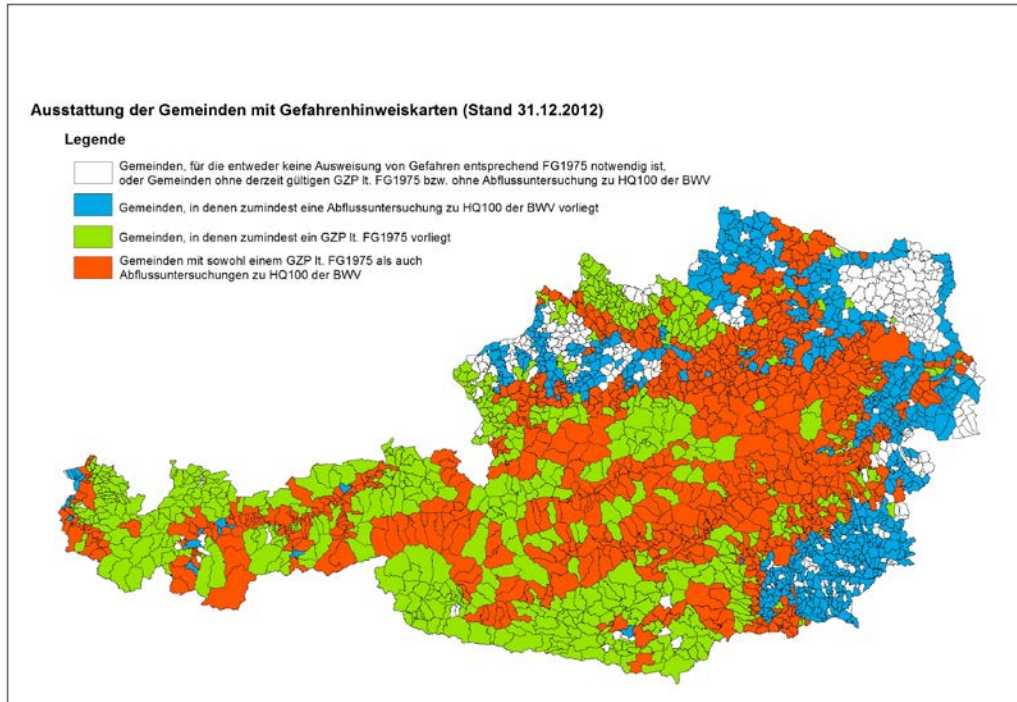






# Governing natural disasters in AT: success factors (5)

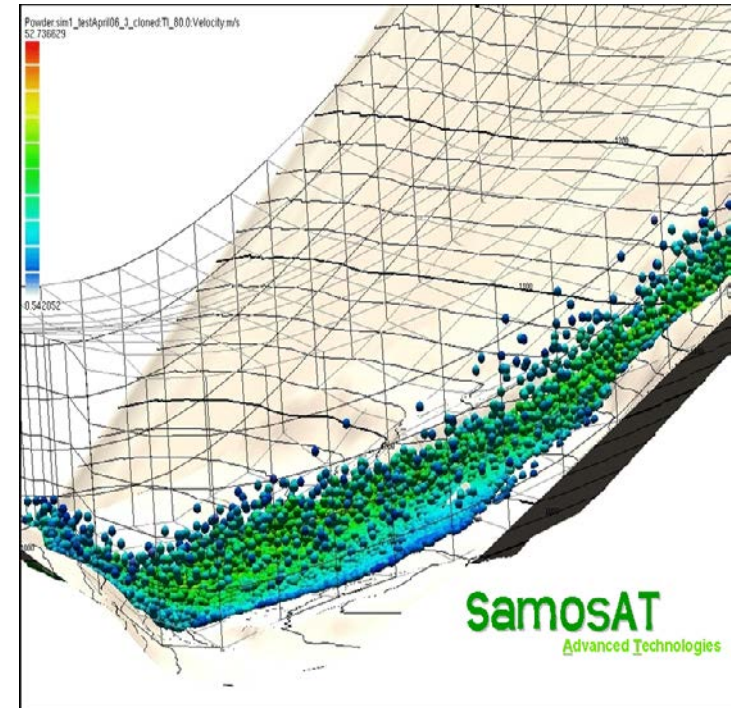
- Information and awareness: High coverage with hazard & risk maps, easy accessible web-based information & support





# Governing natural disasters in AT: success factors (6)

- R&D advances and increasing practical experiences: exchange of knowledge and good co-operation and collaboration on national and international level







# Governing natural disasters in AT: limitations

- > Magnitude of the event
- > Global warming / global changes
- > Limited usable settlement area cause an upward trend in losses from natural disasters, because economic and population growth in higher-risk areas is still contributing to an increase in associated economic losses (and vulnerability in general)
- > Low penetration of private natural hazard insurance
- > Ageing of structural protection facilities – loosing functionality
- > Processes like flash floods, debris flows, snow avalanches etc. are usually fast moving, and difficult to predict - early warning and subsequent actions are limited
- > Limited resources (financial, human, structural)





## Final remarks and recommendations (1)



- > Natural hazards are still complex and are phenomena in nature that cannot be prevented fully, only mitigated. 100% safety against natural hazards is not feasible.
- > NHM has to contribute to avoid increasing depopulation of remote regions in Austria, BUT: NO PROTECTION AT ALL COSTS.
- > NHM is no longer a pure technical discipline, nor a concern of “only” experts - applying risk-cycle and life-cycle based approaches.
- > Beside other constraints, a modern NHM strategy has to balance:

- **technical**
- **economical**
- **ecological**
- **social**
- **legal**
- **political**
- **natural**
- **organisational / institutional**

**standards, interests,  
and uncertainties**

**on a not only local but  
even more regional /  
trans-national / global  
level**







## Final remarks and recommendations (2)

- Capacity building, awareness raising, interdisciplinary communication and co-operation are as key factors of integral natural hazard management
- Investing in concepts that support people in a more ownership of risks (natural hazard proofing, insurance opportunities etc.) is a step towards balancing public and individual demands and interests
- Harmonising/developing technical standards and codes
- Fostering community-based public education initiatives
- Strengthening the principle of cross-border solidarity demonstrated in joint assistance and relief operations among EU Member States
- Emphasising transnational cooperation by exchanging and sharing evidence, experiences, knowledge and methods between administration, technical authorities and academics





**Thank you for your  
attention!**

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