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Federal Department
of the Environment, Transport, Energy and Communications DETEC
Federal Office for the Environment FOEN
Hazard Prevention Division

Integrated Risk Management
Swiss approach to DRR – Flood Protection Strategy & Risk Management

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IWRM Study Visit Pakistan

09. July 2019, Berne

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- Lesson learned from catastrophic events
- Integrated risk management IRM
- Keys of success

Natural hazards in Switzerland

Dynamic flooding

Erosion

Static flooding

Drainage

Hail

Debris flows

Landslides

Storms

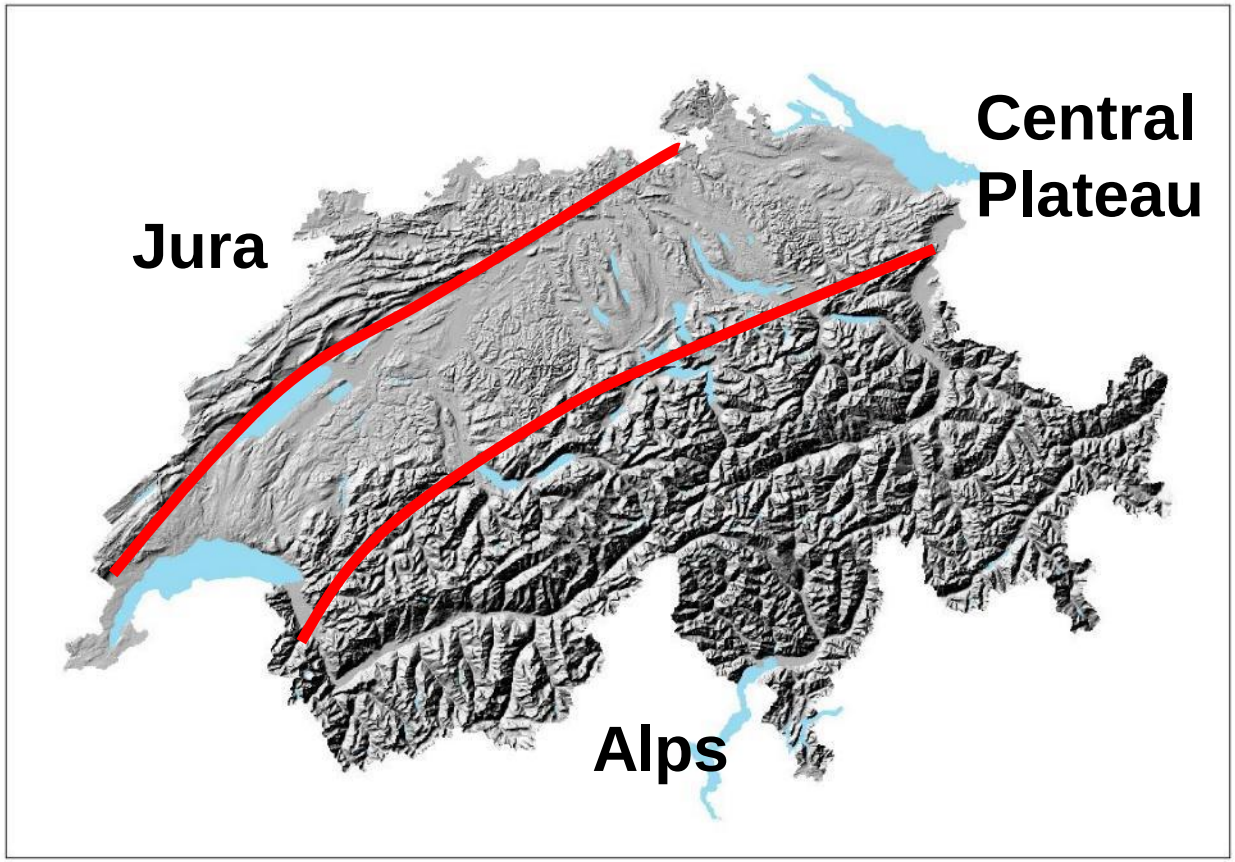
Rockfalls

Earthquakes

Fires

Avalanches

Geographical overview of Switzerland



Area: 41’000 km²

Residents: 8.2 Million, 194 residents per km²

Natural hazards in Switzerland

Jura (10%)
→ Main problems: rockfalls, landslides

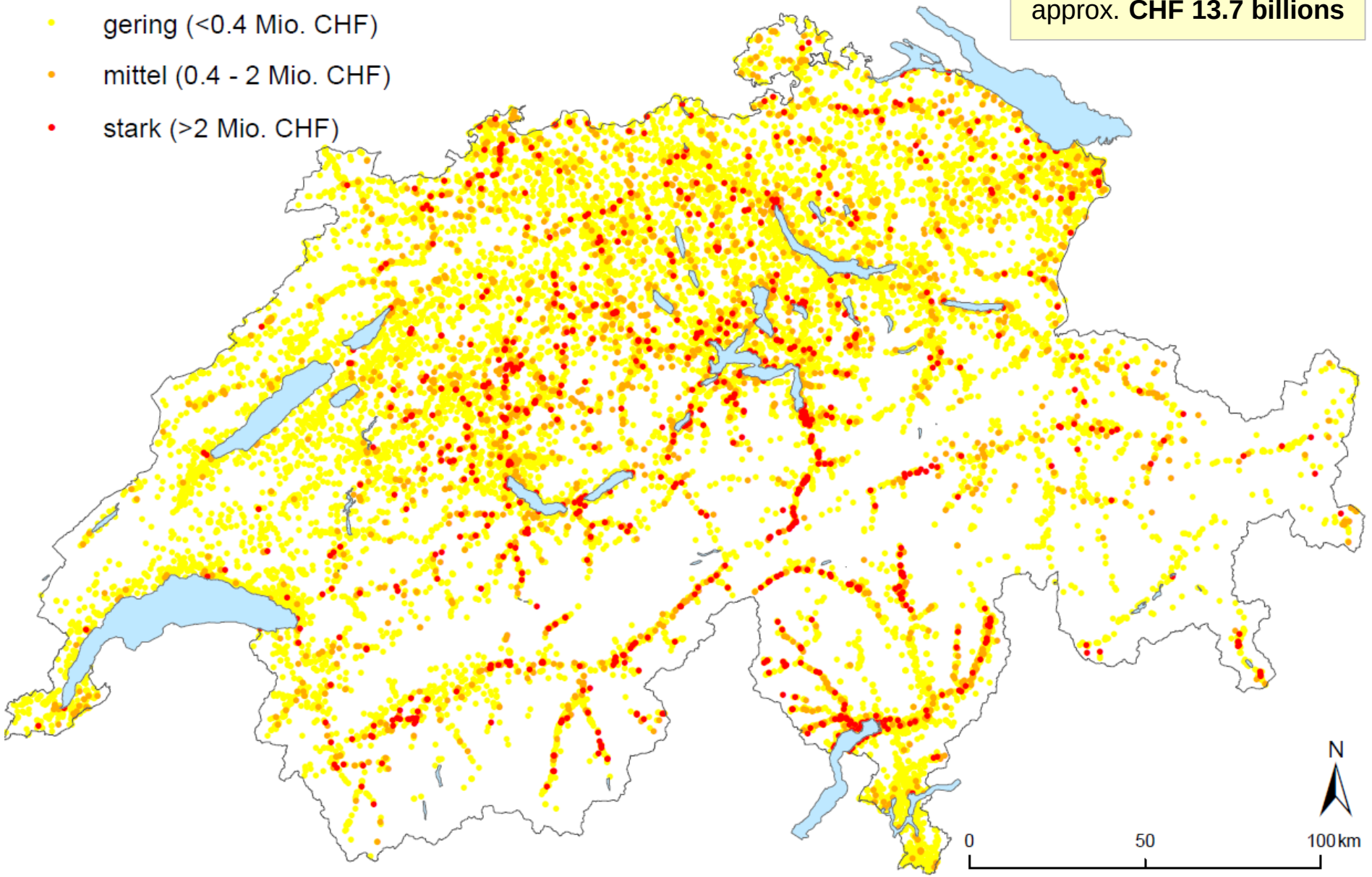
Central Plateau (30%)
→ Main problems: floods, storms, landslides

Over the past 30 years:
70 % of communities were affected by a major natural event!

Mountain regions (60%)
→ Main problems: avalanches, rockfalls, debris flows, landslides

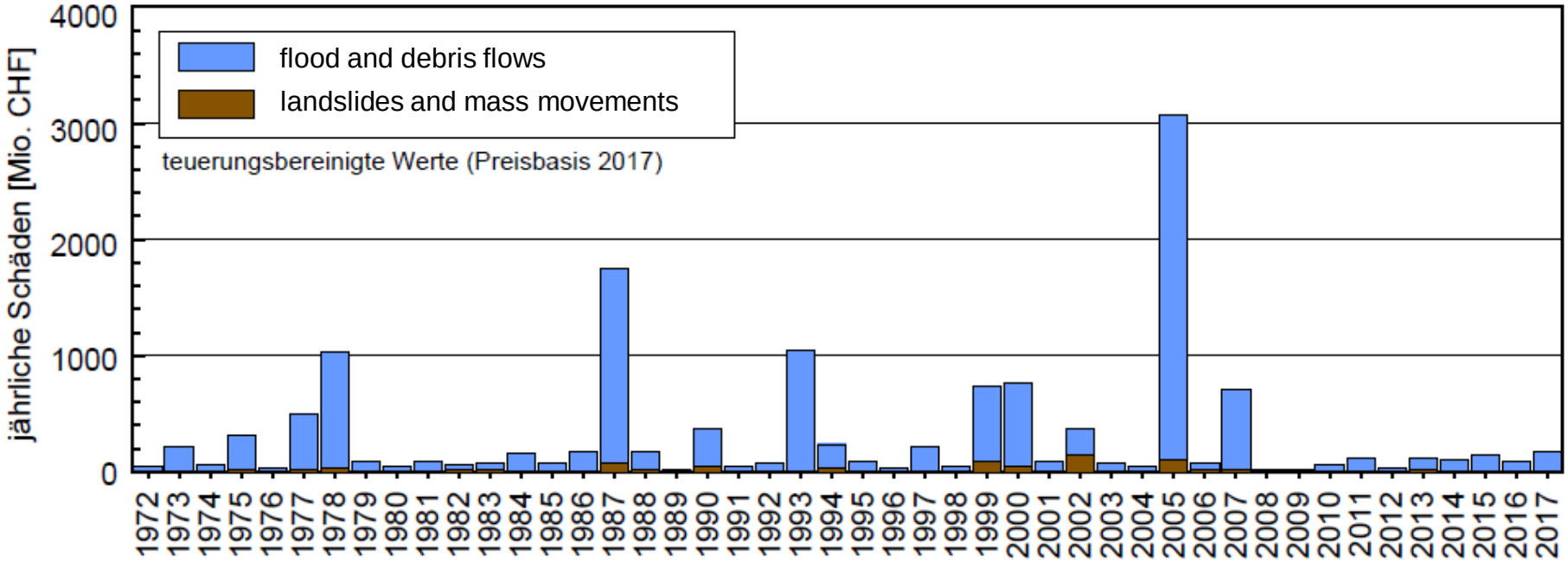
Damages 1972 - 2017

Total damage costs:
approx. **CHF 13.7 billions**



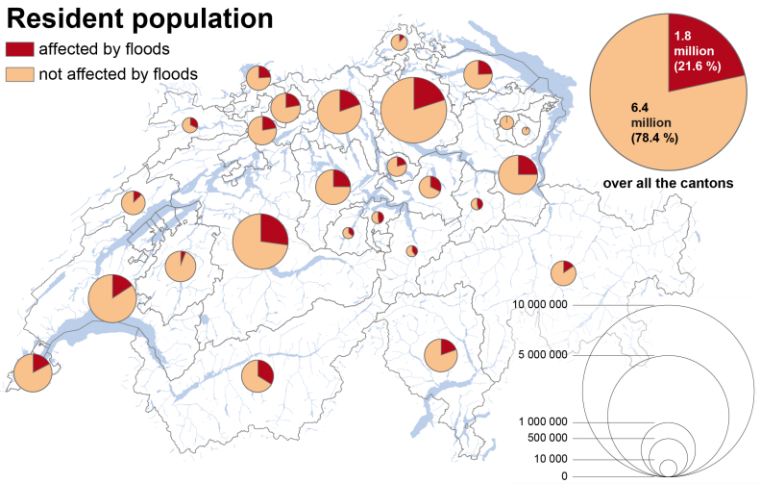
Damage costs (1972 – 2017)

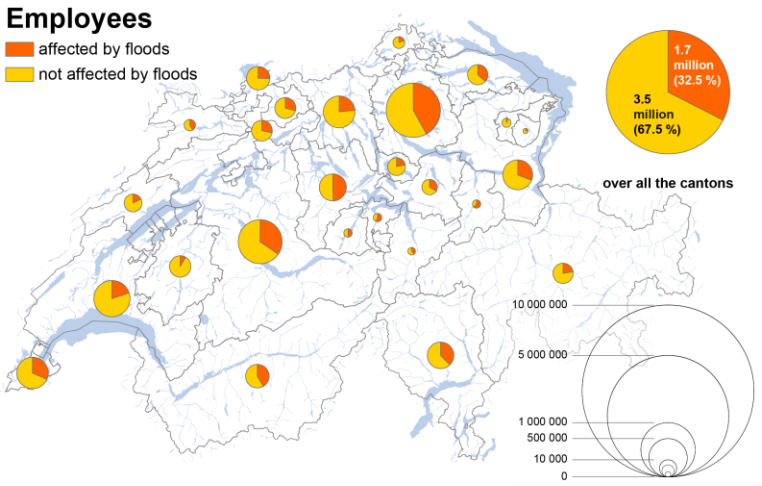
Total damage costs:
approx. **CHF 13.7 billions**

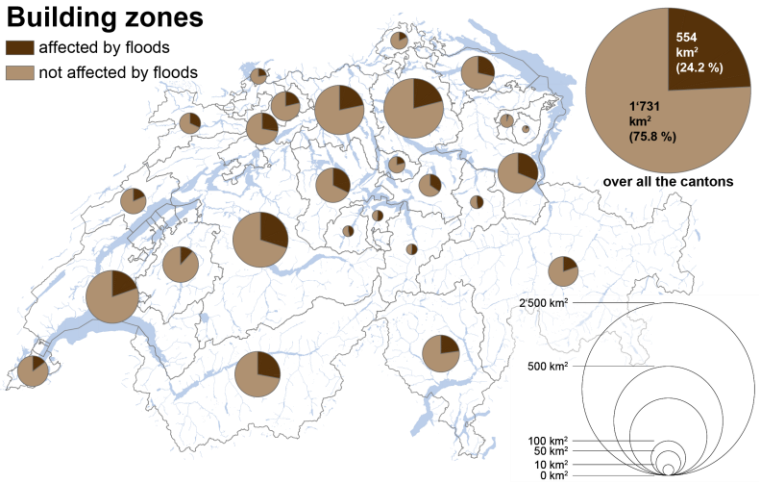


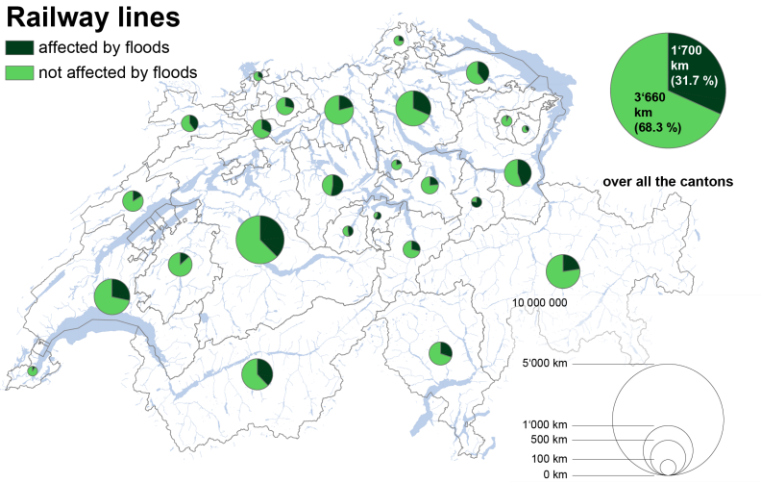
- 5 largest events → 50 % of damage costs
- 10 largest events → 63 % of damage costs

Affected goods (flood)









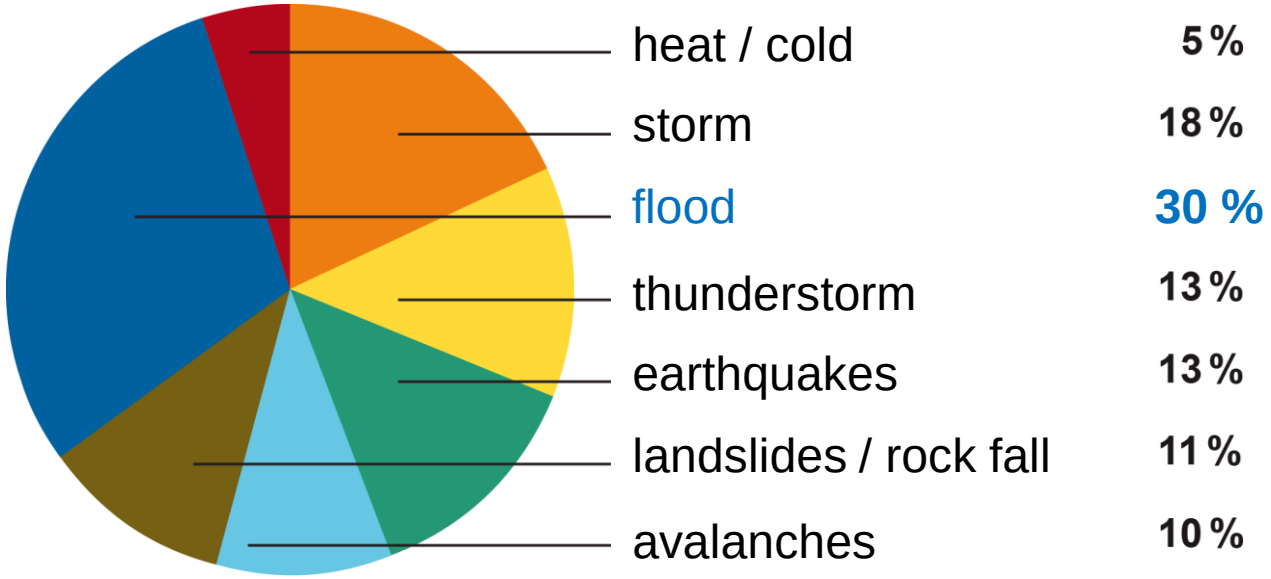
Achieve and maintain security

Annual investments (private an public, all natural hazard)

> ca. CHF 2.9 billions

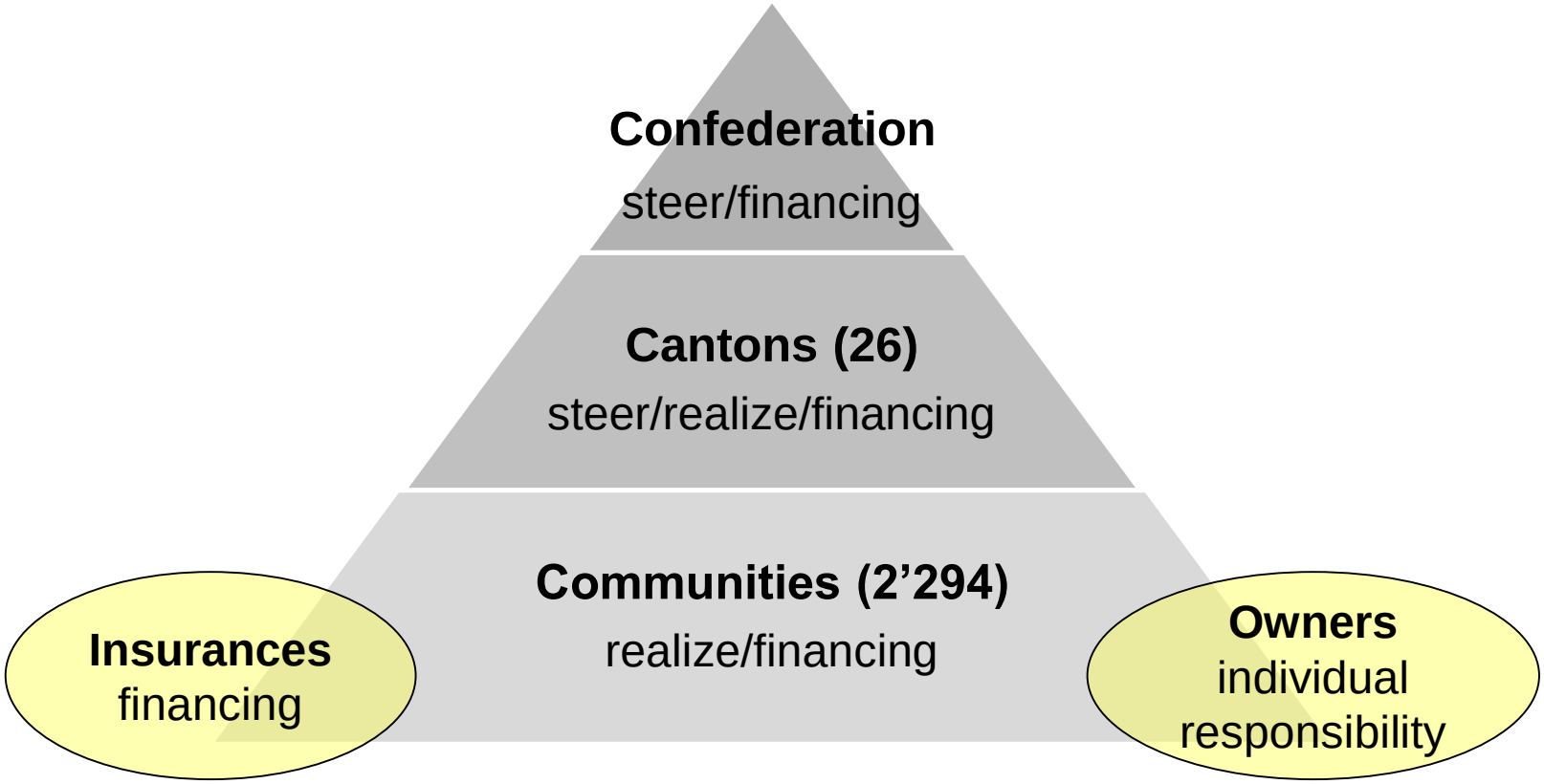
> ca. CHF 1.7 billions (private/insurance)

> ca. CHF 1.2 billions (public)



Source: PLANAT 2007

Governance of DRR in Switzerland

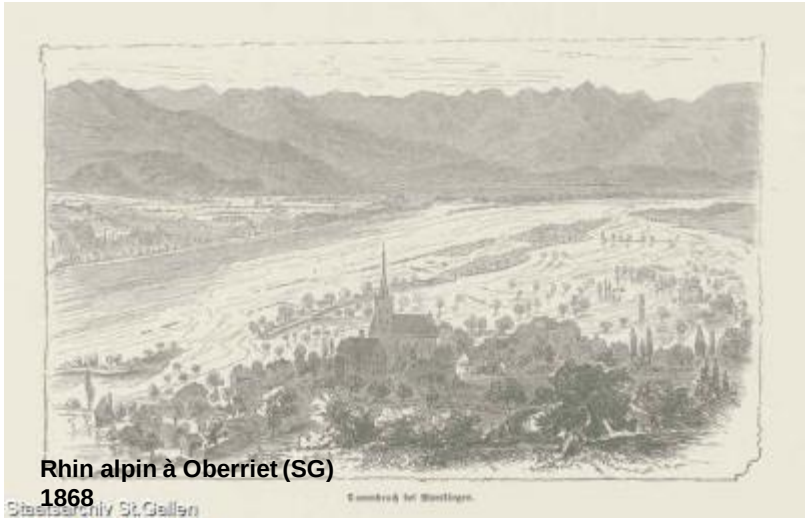


> policy > division of tasks and responsibilities > exchange networks

Who pays (public sector)?

	Investment [CHF p.a.]	Confederation	Cantons	Communities
Flood protection *incl. maintenance*	300 Mio. *60-100 Mio.*	35%-45% *0%*	20%-40% *0-60%*	20%-35% *40%-100%*
Protection against avalanches, rock fall, landslides	110 Mio.	35%-45%	20%-40%	20%-35%
Protective forest	200 Mio.	35%	35%	30%
River renaturation	60 Mio.	35%-80%	10%-35%	5%-20%

Lesson learned from catastrophic events


Rhin alpin à Oberriet (SG)
1868

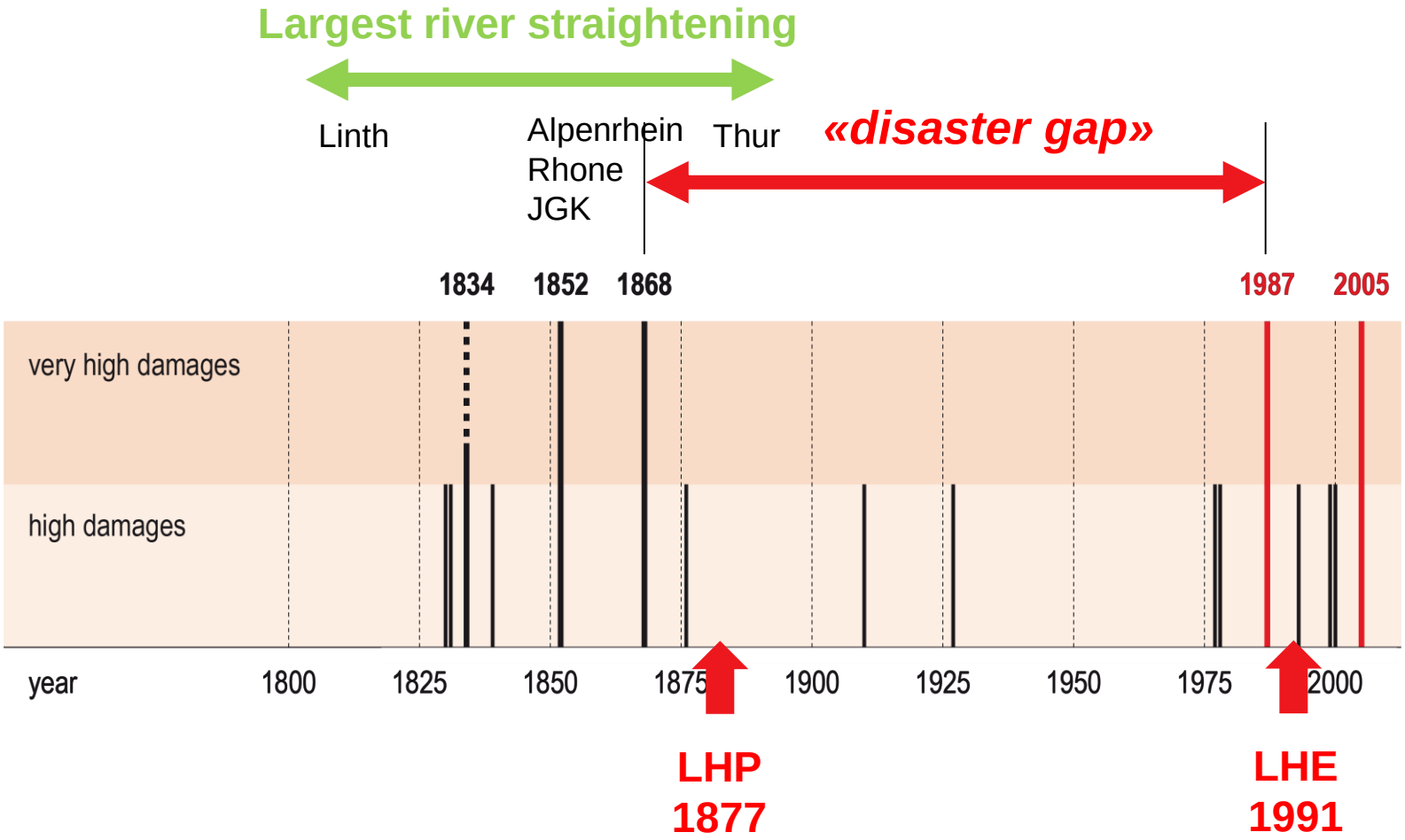
Reuss dans la vallée de la Reuss (UR)
1987

Poschiavino à Poschiavo (GR)
1987

Aare à Berne (BE)
2005

Disaster events since 1800

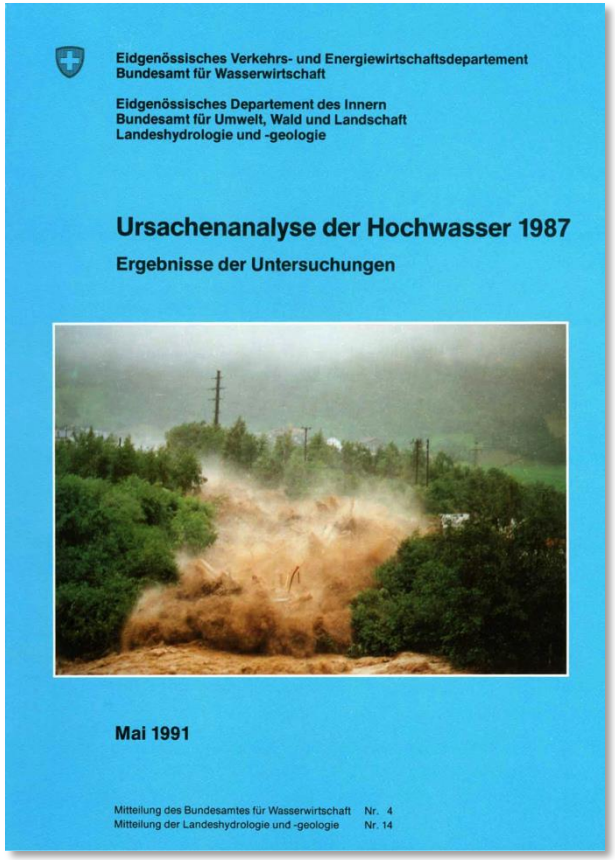
Supraregional flood events in Switzerland



Flood events with total damages (according to today's value) between 500 million and several billions Swiss Francs

A turning point for flood protection

The floods of 1987 – analysis and lessons learned

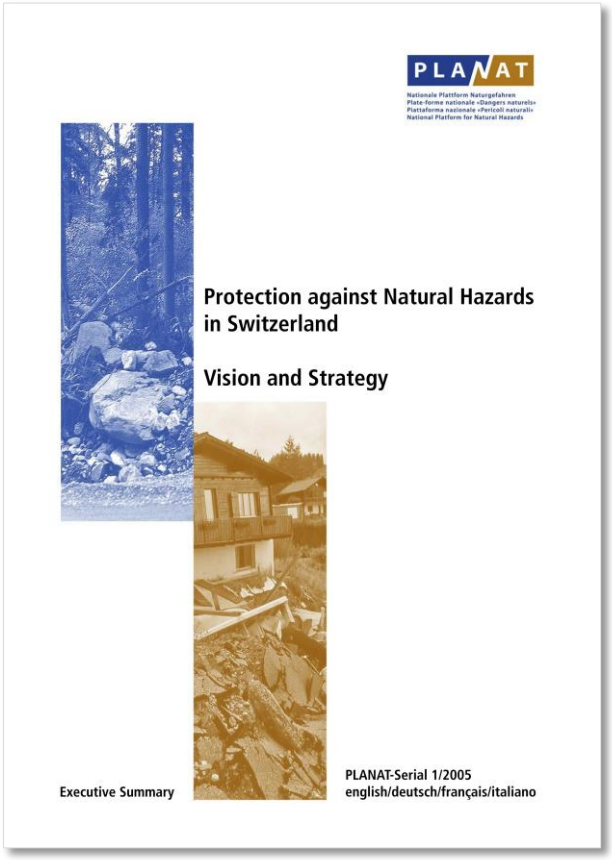


- no absolute safety
- differentiated protection objectives
- importance of:
  - hazard fundamentals
  - land use planning
  - maintenance

> ***Adaptation of laws on hydraulic engineering and forests in 1991***

Paradigm shift into a risk culture

Strategy Natural Hazards Switzerland (2004)

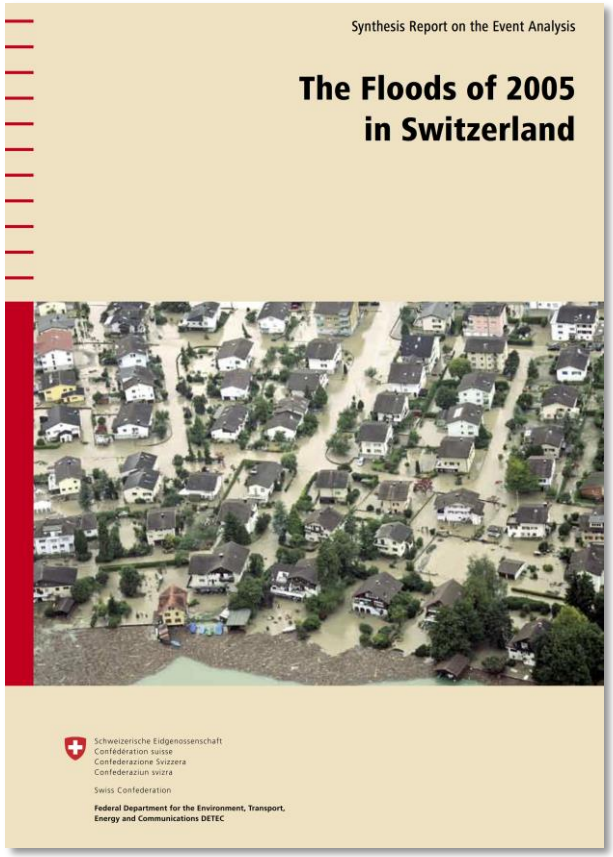


- culture of risk
- integrated risk management
- risk fundamentals
- risk dialogue

> ***implementation of PLANAT action plan (2005-2011)***

Momentum by the floods of 2005

The floods of 2005 – analysis and lessons learned



- improve coordination
- improve forecasts, early warning and alerting
- raise public awareness
- encourage individual responsibility

> ***set of measures to improve early warning and alerting (OWARNA)***

Paradigm shift after extreme floods in 1987 / 2005

Before 1987: **hazardous events and disasters** have to be **avoided**

1987 floods: 1.8 bn CHF losses

Key findings: Risks can be **avoided**, **reduced** or **transferred**
But some have to be **accepted**!

→ Safety for everyone and everything is not possible
→ Pure defense measures are no longer an option

2005 floods: 3 bn CHF damages

Key findings: coordination, forecast and warning, awareness raising of the population and more individual responsibility

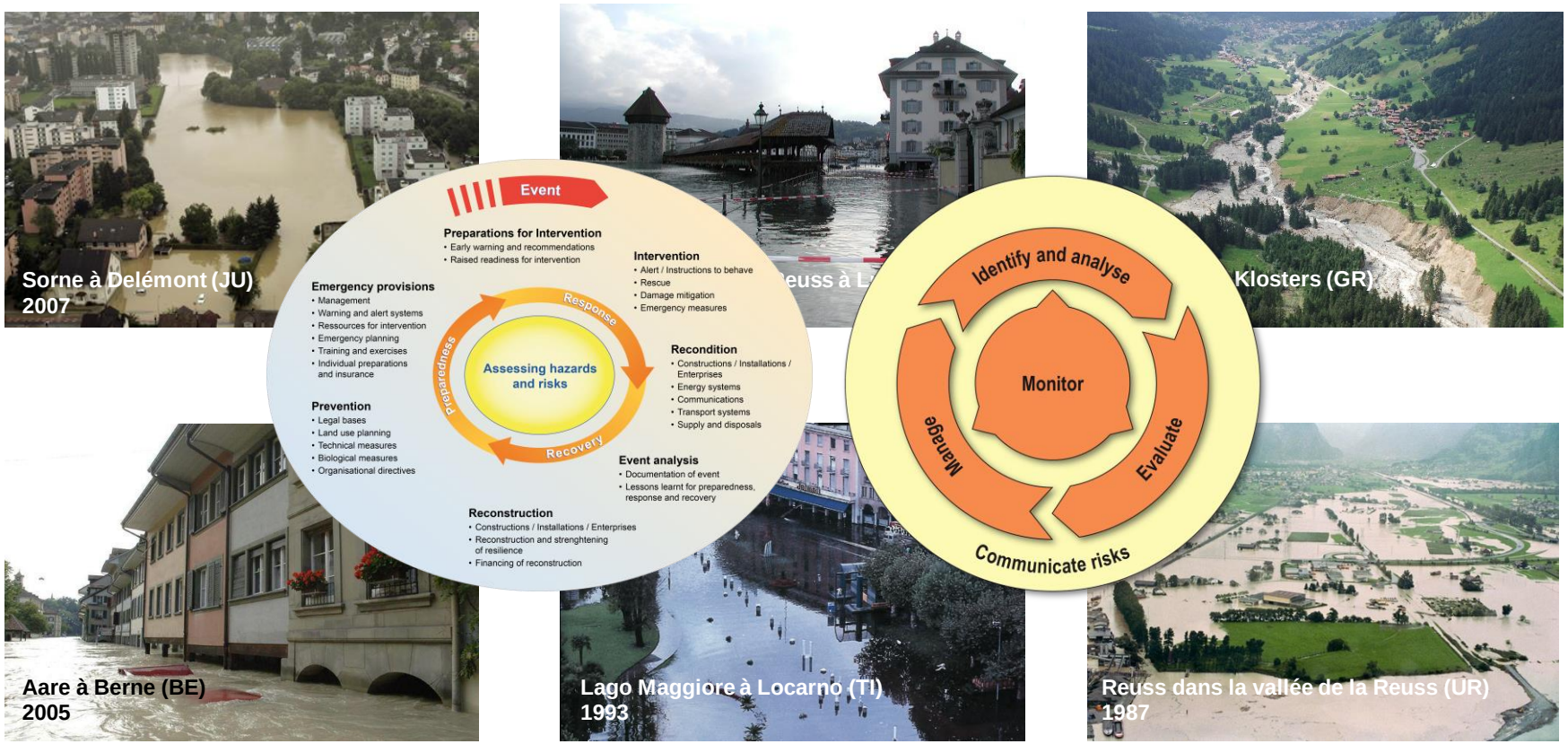
Political support after 2005

«Comparable and even more severe events will arise in the future. In order to avoid similar or even worse consequences, we would like and must continue to implement consistent flood protection measures.»

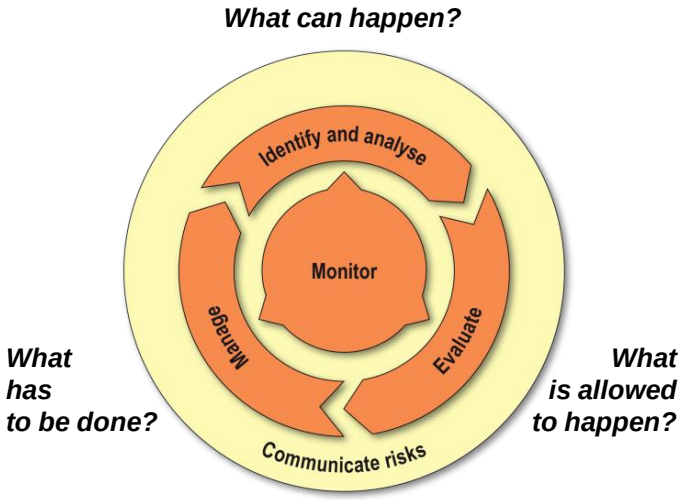
«***Thus integrated risk management is required.***»

Federal Councillor Moritz Leuenberger
Head of the Federal Department for the Environment, Transport, Energy and Communications DETEC, 2008

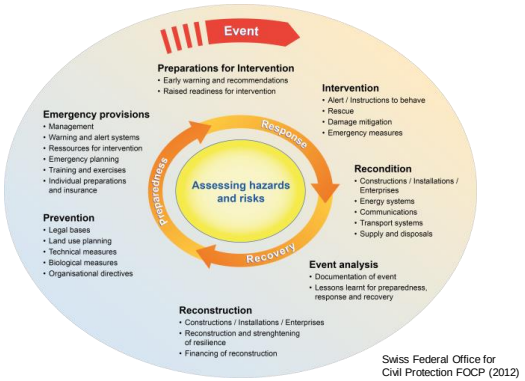
Integrated risk management IRM



Meaning of IRM



Risk management tasks



Range of measures involved in integrated risk management

Risk management

Continuous and systematic identification, analysis and evaluation of risks, planning and implementation of measures in response to detected risks

Integrated risk management considers

> all prevailing natural hazards
> all process specific conditions
> all options for action
> all types of measures
> all future developments
> all aspects of sustainability

and involves

> all responsible actors and the directly affected

Evolution of IRM

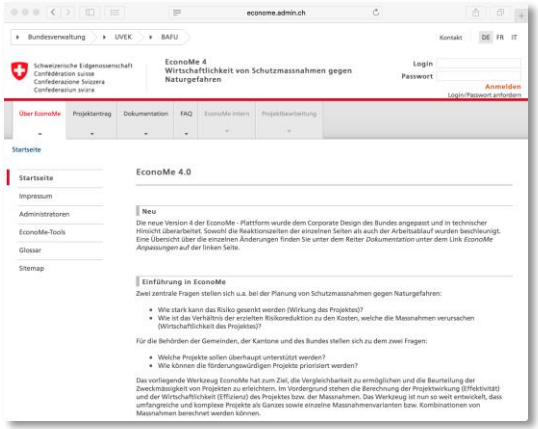
Risk-based approach in protection projects

Manual «Programme agreements»

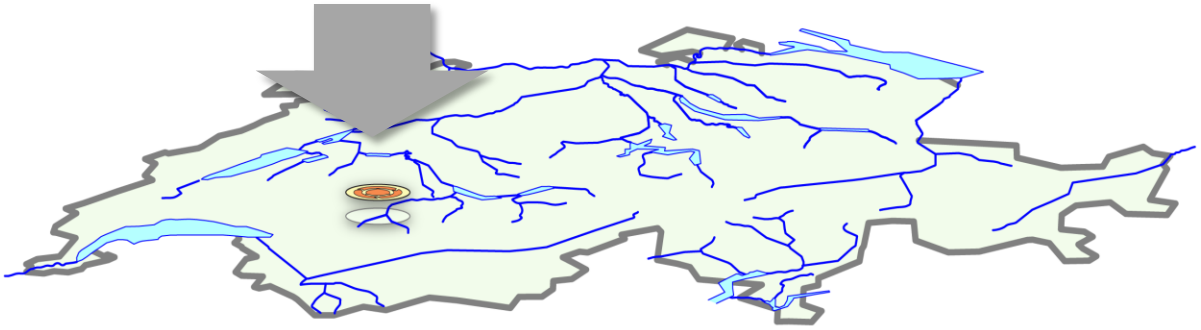
Important part of the subsidy policy

Online-tool «EconoMe»

Calculation of risk, cost-benefit analysis



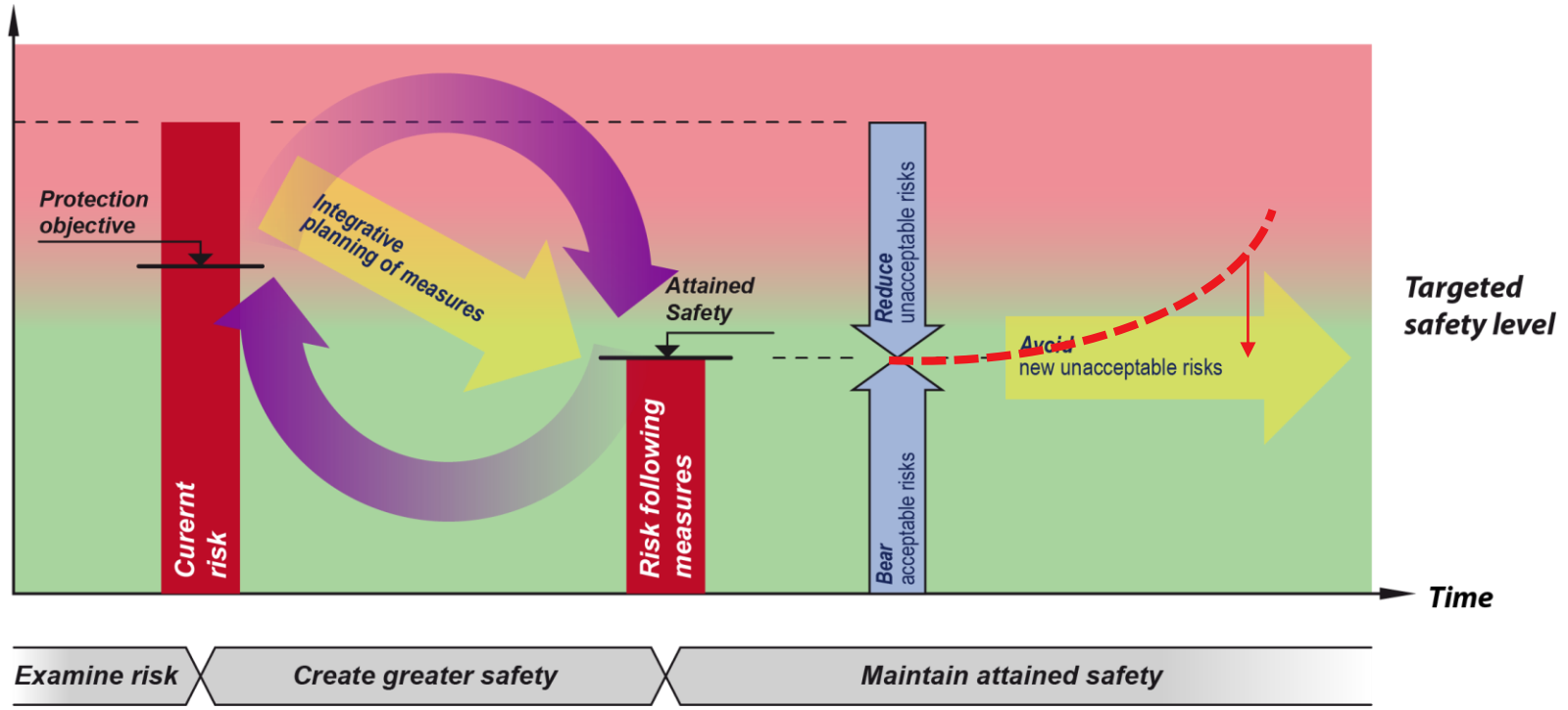
local



Evolution of IRM

Achieve and maintain security

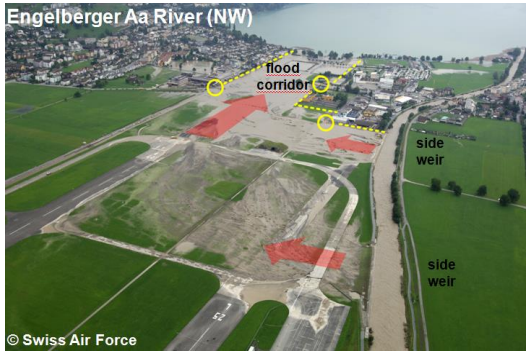
Avoid new unacceptable risks



Protection objectives to assess the need for action	Integrative planning: participatory process, optimisation considering all aspects of sustainability	Long-term preservation of the attained security level with - spatial planning measures - comprehensive management of protection infrastructure - hazard-proofed buildings and infrastructures

Achieve and maintain security

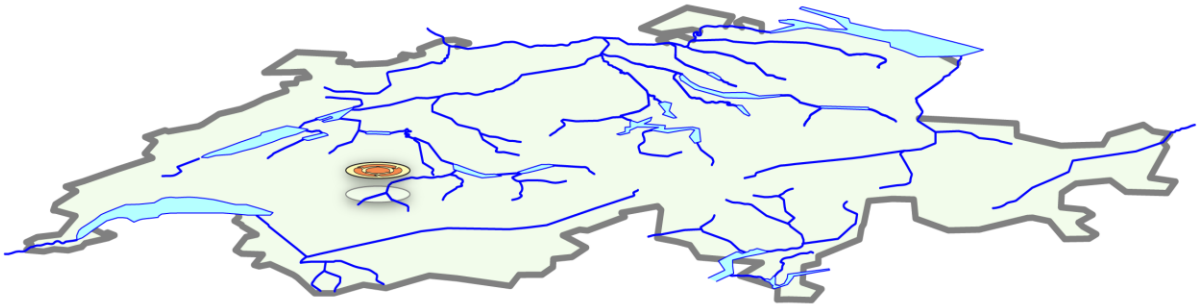
Types of measures



Further development of IRM

«bottom up» and «top down»

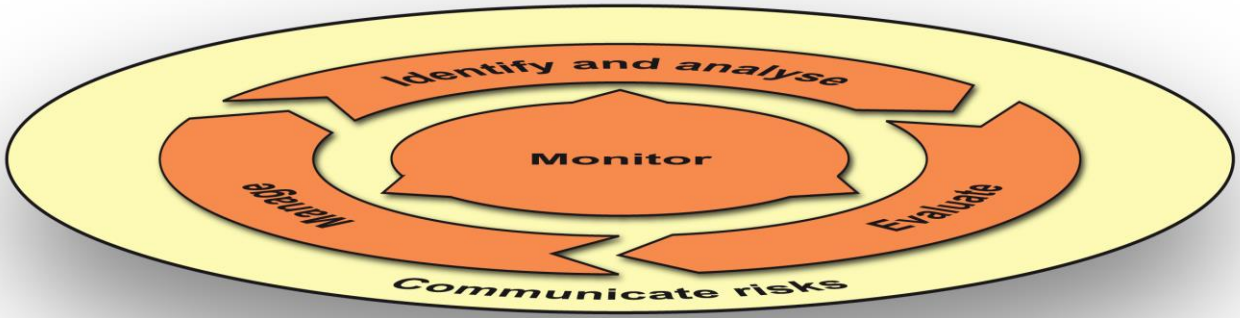
local



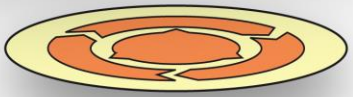
Further development of IRM

«bottom up» and «top down»

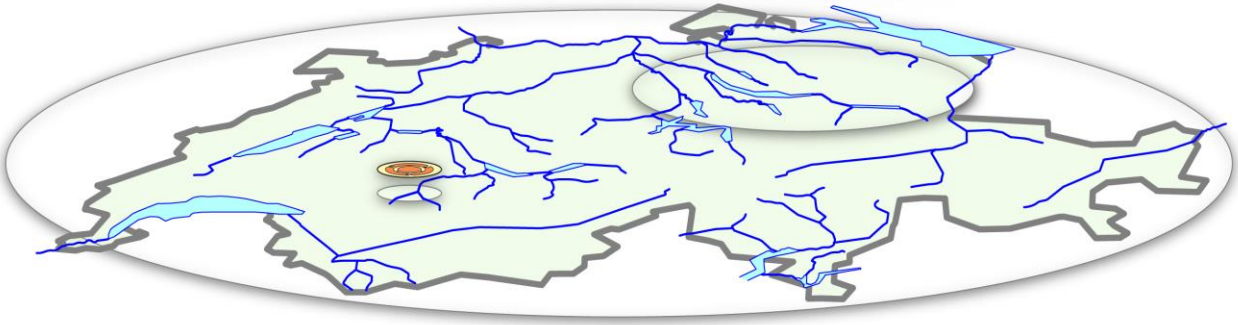
national



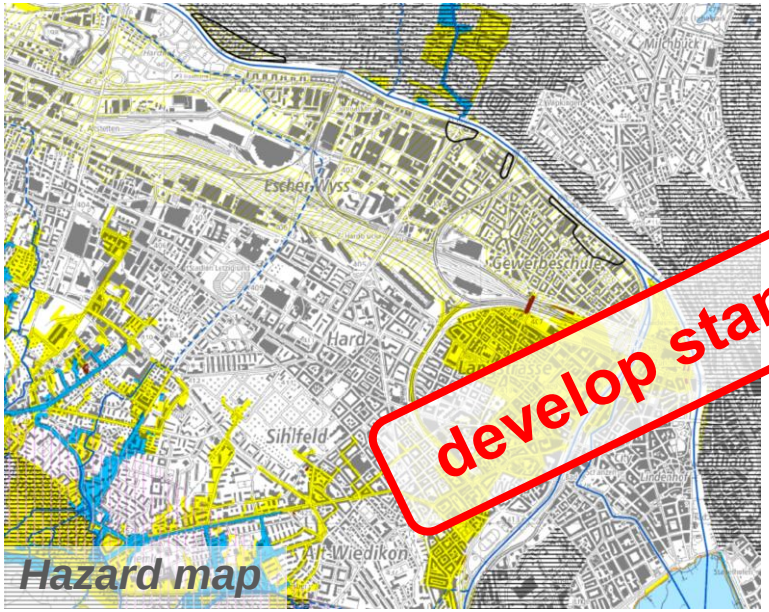
cantonal



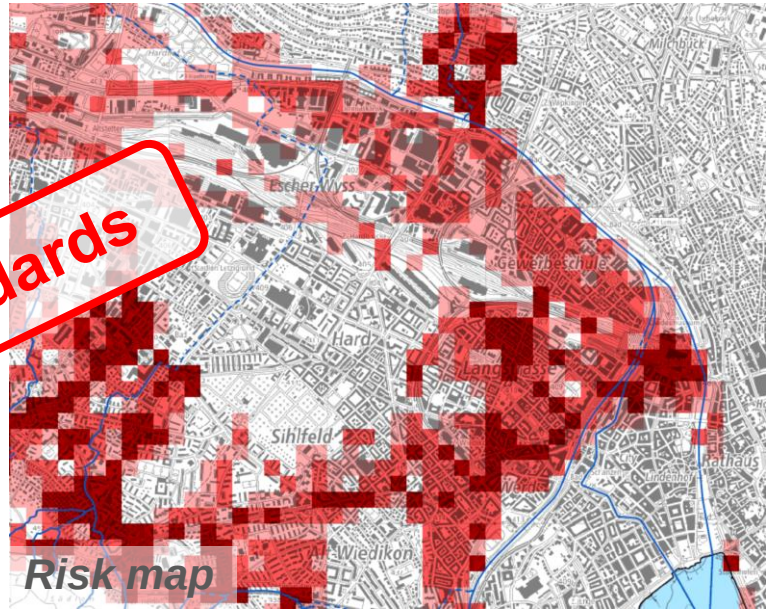
local



Risk overviews – Local



develop standards



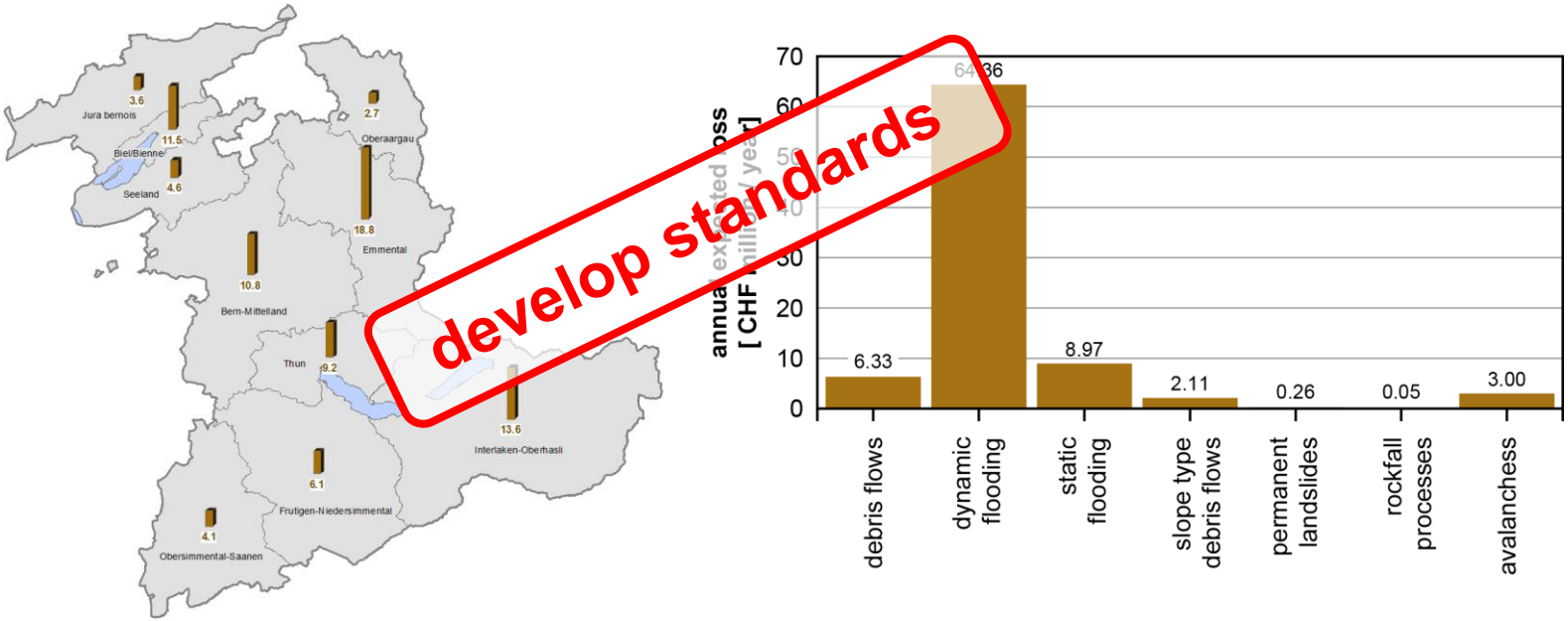
Risk map Zurich – topic and aim:

- consequences for persons, material assets, lifelines, vital goods and services, cultural goods, environment (geo-referenced data available)
- comparability through classification of protected objects according to their importance (by means of risk indices)

> ***Identify hotspots, highlight need for action, promote risk dialogue***

Risk overviews – Cantonal

Annual expected losses for permanently inhabited buildings differentiated by administrative units and hazard processes

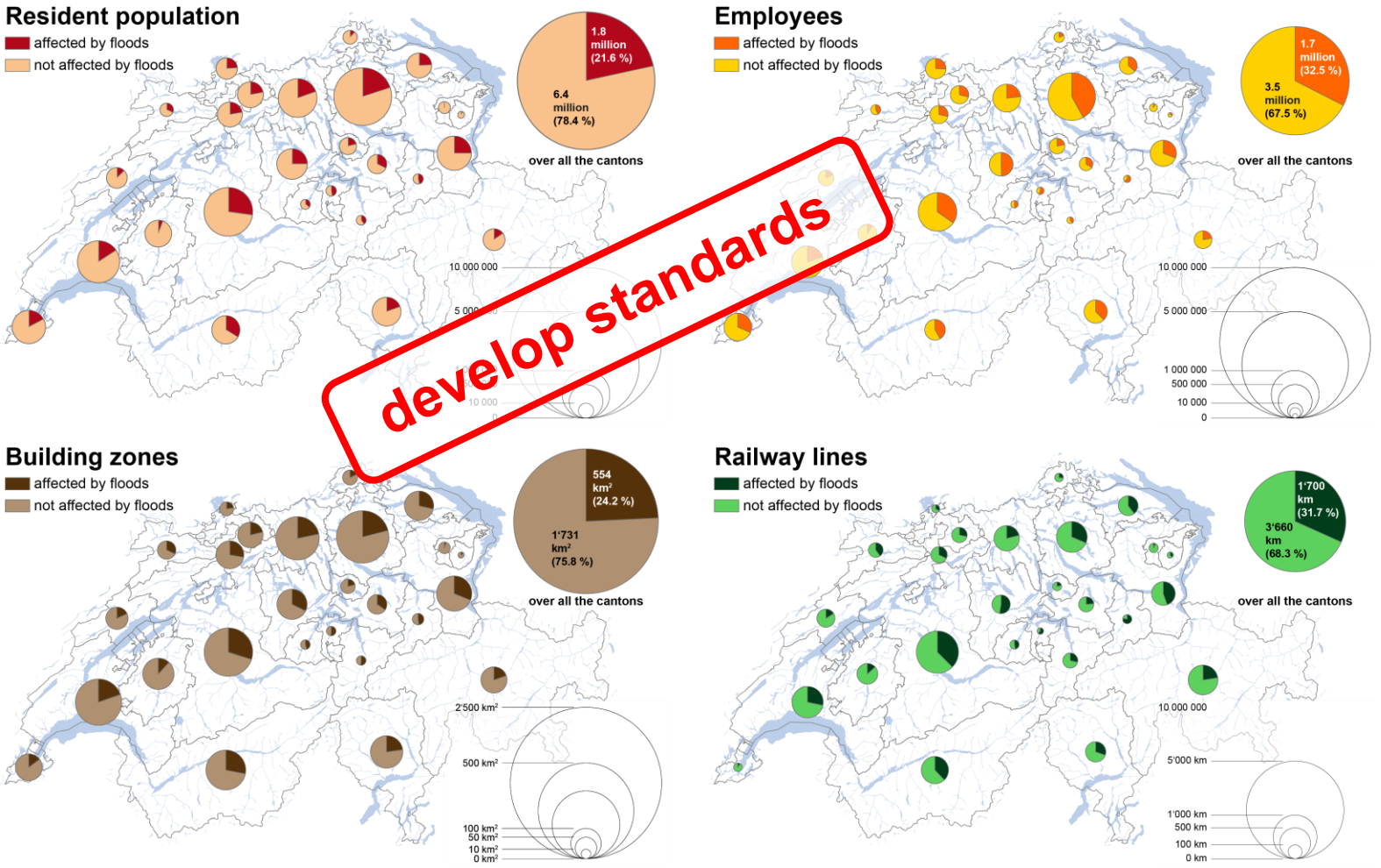


Risk overview Bern – topic and aim:

- overall view of the threat for persons, building zones and residential buildings for different processes
- annual expected losses for personal and property risks

> ***highlight need for action***

Risk overviews – National



> ***point out the affectedness***

Strategic planning – Cantonal

Goals of the strategic planning

- **Promotion** of integral risk management (IRM)
- at cantonal **strategic** level
  - Determination **of the need for action**
  - Long-term **management of risks**
  - **Efficient and optimal use** of public funds to protect against natural hazards
  - Promoting **coordination**

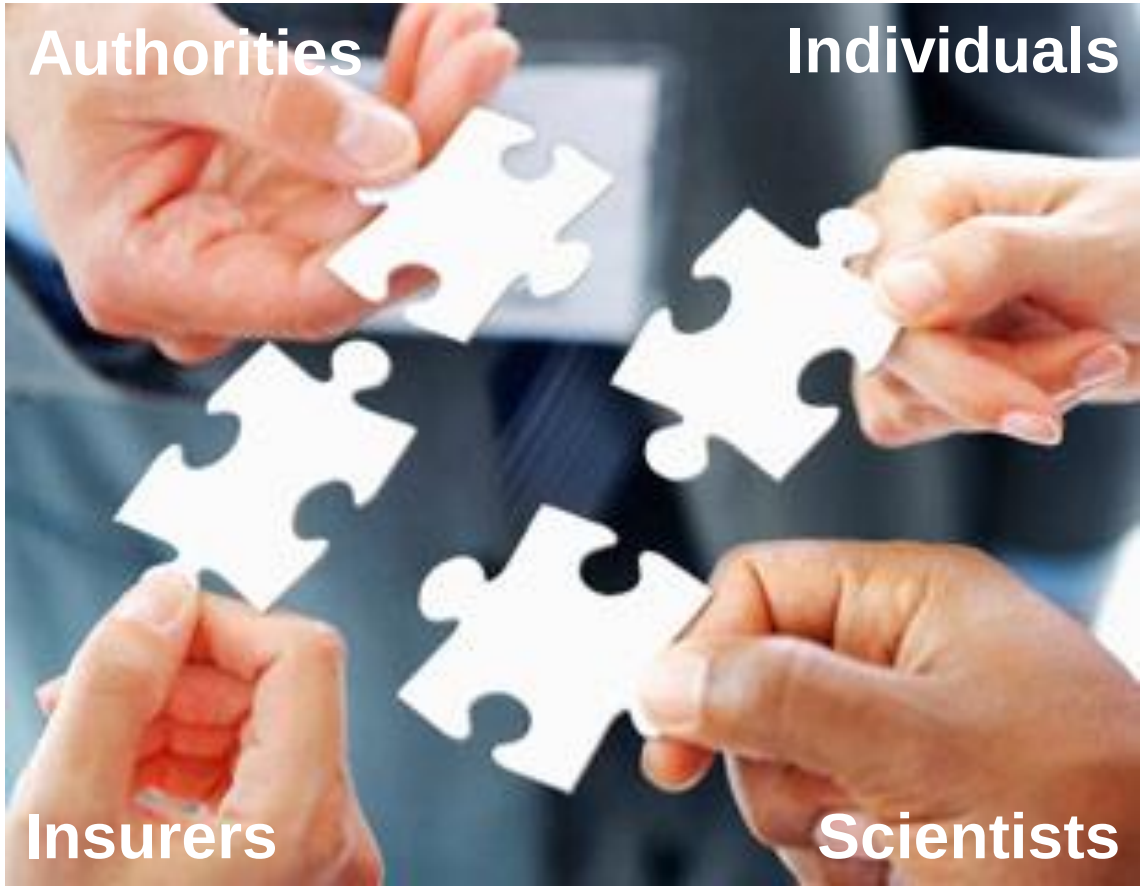
- The strategic planning comprises the **main processes**
  - Water, landslides, falls and avalanches

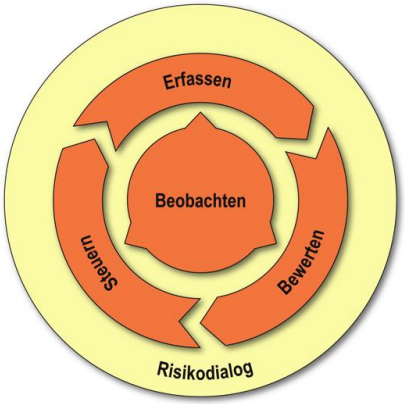
> Coordination of the measures, justify the budgetary requirements

Keys of success

Cooperation

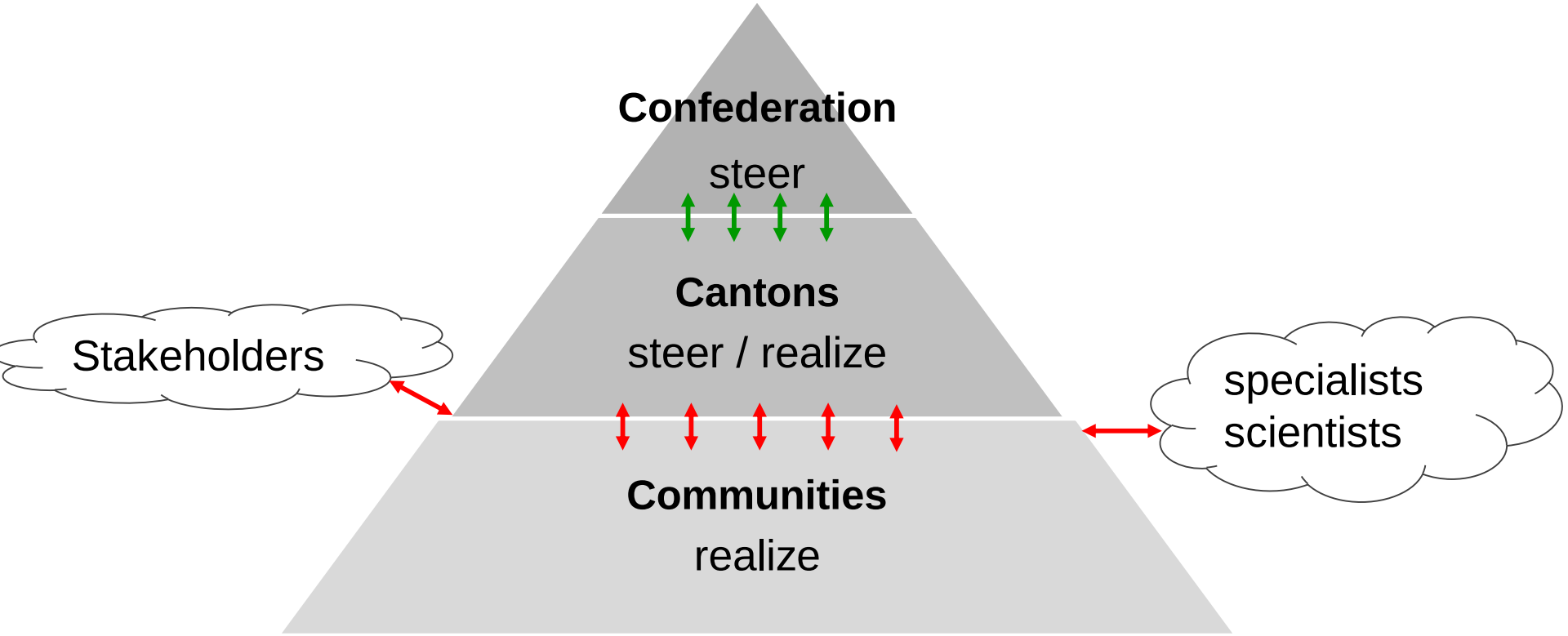
www.iqperhour.com





> overview > common understanding > concerted action

Competences

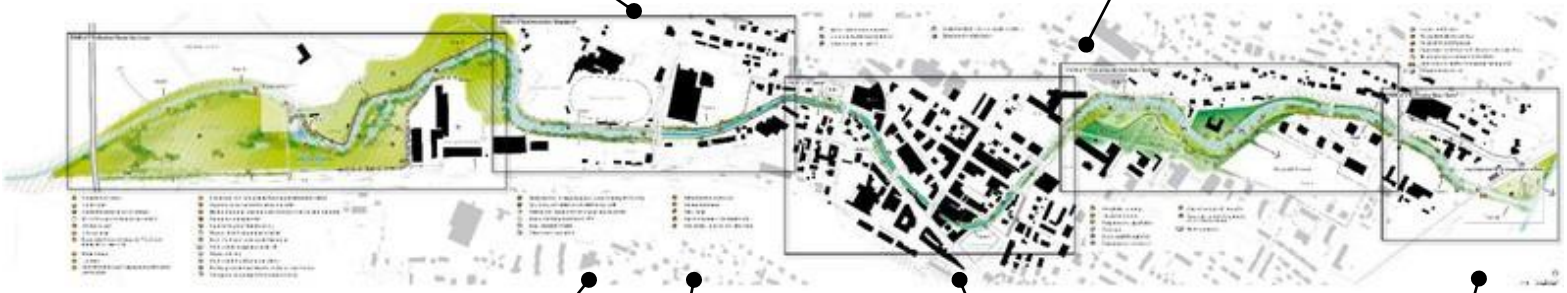


> exchange networks> information > further education

Synergies

flood protection

river renaturation



improvement of infrastructures

reorganisation of land use

reorganisation of mobility

improvement of recreation infrastructure

Dealing with natural hazards today and tomorrow

Report «Dealing with natural hazards in Switzerland»

- comprehensive analysis by 2016
- participatory process involving all relevant actors

> ***Fields of action:***

- ***optimize the use of financial resources by prioritization***
- ***subsidy further types of measures***
- ***comprehensive master plans***
- ***adaptation of legislation***

Thank you for your attention!