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

Carlo Scapozza
Hazard Prevention Division, Federal Office for the Environment FOEN

Visit of the Vice Minister of Water Resources, China

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Flood protection in Switzerland Governance
Governance of DRR in Switzerland

> policy > division of tasks and responsibilities > exchange networks
Flood protection in Switzerland
Overview

- Sorne à Delémont (JU) 2007
- Vierwaldstättersee/Reuss à Lucerne (LU) 2005
- Landquart à Klosters (GR) 2005
- Aare à Berne (BE) 2005
- Lago Maggiore à Locarno (TI) 1903
- Reuss dans la vallée de la Reuss (UR) 1987
Damage potential for protected objects

Resident population
- affected by floods
- not affected by floods

1.8 million
(21.6 %)

6.4 million
(78.4 %)

over all the cantons

Residents affected by floods:
- 1.8 million
- 21.6%

Residents not affected by floods:
- 6.4 million
- 78.4%

Map showing distribution of affected and unaffected residents across cantons.

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Affected goods

Resident population
- Affected by floods
- Not affected by floods

Employees
- Affected by floods
- Not affected by floods

Building zones
- Affected by floods
- Not affected by floods

Railway lines
- Affected by floods
- Not affected by floods

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**Damages 1972 - 2016**

- low \(<0.4\) Mio. CHF
- middle \(0.4 - 2\) Mio. CHF
- high \(>2\) Mio. CHF

Total damage costs: approx. **CHF 13.5 billions**
Cumulated damage costs

Damages due to flood, slope instabilities and slides in Switzerland since 1972
(Data: WSL, FOEN)

Values adjusted to account for price rise (price basis: 2009)
Fatalities caused by floods, debris flows, landslides and fall processes

Number of fatalities

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Achieve and maintain security

*Investments in flood protection (confederation, approximately 1/3 of all public investments)*

Approx. value of protection infrastructure: CHF 40 billions

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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
Lessons 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 due to the floods in 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)
Political support

«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

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Meaning of IRM

**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

<table>
<thead>
<tr>
<th>Examine risk</th>
<th>Create greater safety</th>
<th>Maintain attained safety</th>
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<tbody>
<tr>
<td>Protection objectives to assess the need for action</td>
<td>Integrative planning: participatory process, optimisation considering all aspects of sustainability</td>
<td>Long-term preservation of the attained security level with - spatial planning measures - comprehensive management of protection infrastructure - hazard-proofed buildings and infrastructures</td>
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Types of measures
Further development of IRM

«bottom up» and «top down»
Further development of IRM

«bottom up» and «top down»

national

cantonal

local
Risk overviews – Local level

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 level

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

Resident population
- affected by floods
- not affected by floods

Employees
- affected by floods
- not affected by floods

Building zones
- affected by floods
- not affected by floods

Railway lines
- affected by floods
- not affected by floods

> point out the affectedness, justify the budgetary requirements

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Concept for higher-level risk overviews

- consistent over several levels
- based on homogenous data
- as detailed as necessary
- as generalised as possible
- «evaluated damage potential»
- aggregation of risk indices across protected objects and spatial units
- presentation of the overall risk (not only of the deficits)

> need for action, priorities
Keys of success
Cooperation

> overview > common understanding > concerted action
Synergies

- Flood protection
- River renaturation
- Improvement of infrastructures
- Reorganisation of mobility
- Reorganisation of land use
- 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
Tank you for your attention!