

Welcome to the webinar

Learning from disasters through event analyses

16 September 2026



SDC Network **Climate, DRR & Environment**



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**Swiss Agency for Development
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Tech tips



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Before we start...



Please introduce
yourself in the chat



Please write:

- Your name
- Your organisation
- Where you are joining from

Why this webinar?

PROGRAM

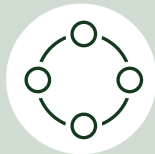
Event analyses in Switzerland

Antoine Magnollay
FOEN

Event analyses in Pakistan and Armenia

Christoph Lehmann

Discussion & WRAP UP



Leveraging Swiss expertise for event analyses abroad

Regina Gujan
SDC

UNDRR perspectives

Emilia Wahlstrom
UNDRR

Event analyses in Switzerland

Antoine Magnollay

Federal Office for the
Environment FOEN



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Federal Department of the Environment, Transport,
Energy and Communications DETEC

Federal Office for the Environment FOEN
Natural Hazards & Forests Division

Event analyses in Switzerland

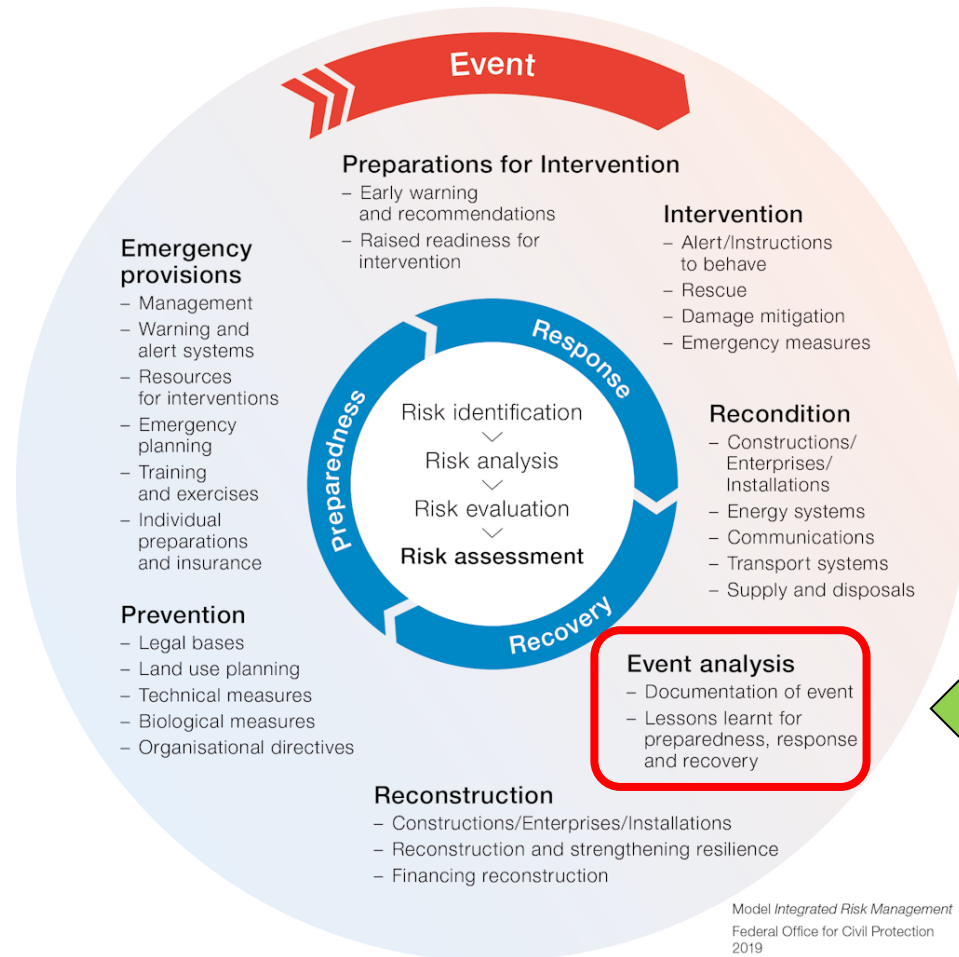
Turning Disasters into Institutional Learning



Antoine Magnollay, FOEN Hazard Prevention Division



Element of Integrated Risk Management (IRM)



Event analyses are the only way to **REALLY** check the **quality of fundamentals and measures** and are a key element of integrated risk management and its further development.



Motivation

- Better understanding of **hazard processes** and the **effectiveness of preventive measures**
- **Evaluation of the effectiveness** of existing knowledge bases, preparedness measures and warning systems
- Assessment of current planning principles for **flood protection measures**
- Good examples and best practices for **professionals**
- **Raising public awareness** of hazards and warnings
- **Conclusions** and **lessons learned** for future **natural hazard management**



Event analyses count among the most important, yet non-schedulable, forms of monitoring: Reactions to an event analysis's findings can include **strategic directives, changes to legislation, or reallocation of funding.**



Legal mandate and division of responsibilities



- The **Confederation** and the **Cantons** are required, under the [Regulation on Hydraulic Engineering](#), Art. 4 and 5, as well as the [Forest Ordinance](#), Art. 16, to analyse major damage events.

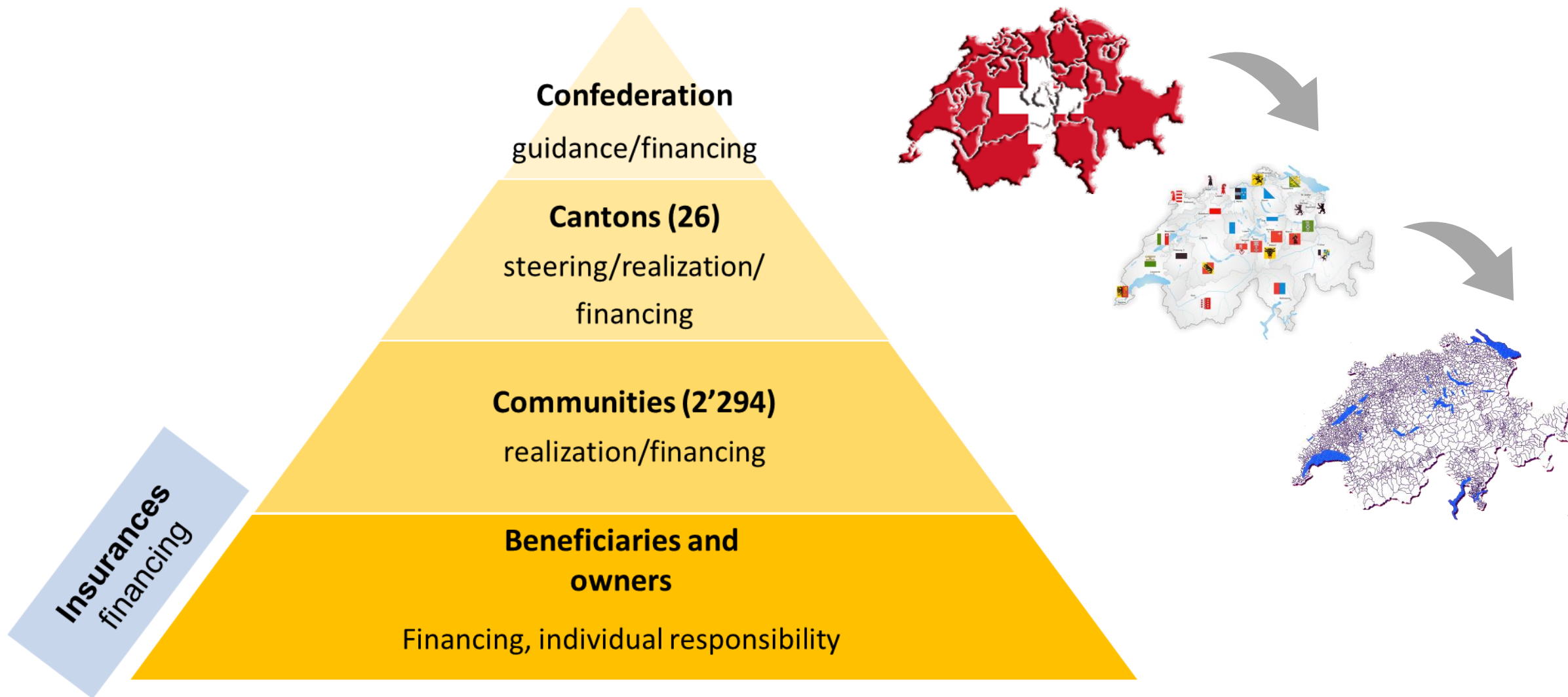
Switzerland has no dedicated constitutional article on natural hazards and a division of tasks take in place. The mandate is assembled from several sectoral federal laws and cross-cutting constitutional provisions:

- **Wasserbaugesetz (WBG)** - the Federal Hydraulic Engineering Act - governs flood protection measures and financial compensation to cantons.
- **Waldgesetz (WaG)** - the Federal Forest Act - covers protection against avalanches, landslides, erosion, and rockfall, since protective forest functions fall under forestry law.
- **Art. 57 BV (Federal Constitution, «Security»)** - a cross-cutting competence that applies equally to the Confederation and Cantons, obliging both to keep public safety in view whenever they exercise their own competencies - extends to natural hazards, particularly where impacts are nationally relevant.

Under **Water Management** and **Forestry Legislation**, the Confederation grants Cantons subsidies (Abgeltungen) for measures **protecting people** and **significant assets** from natural hazards events.

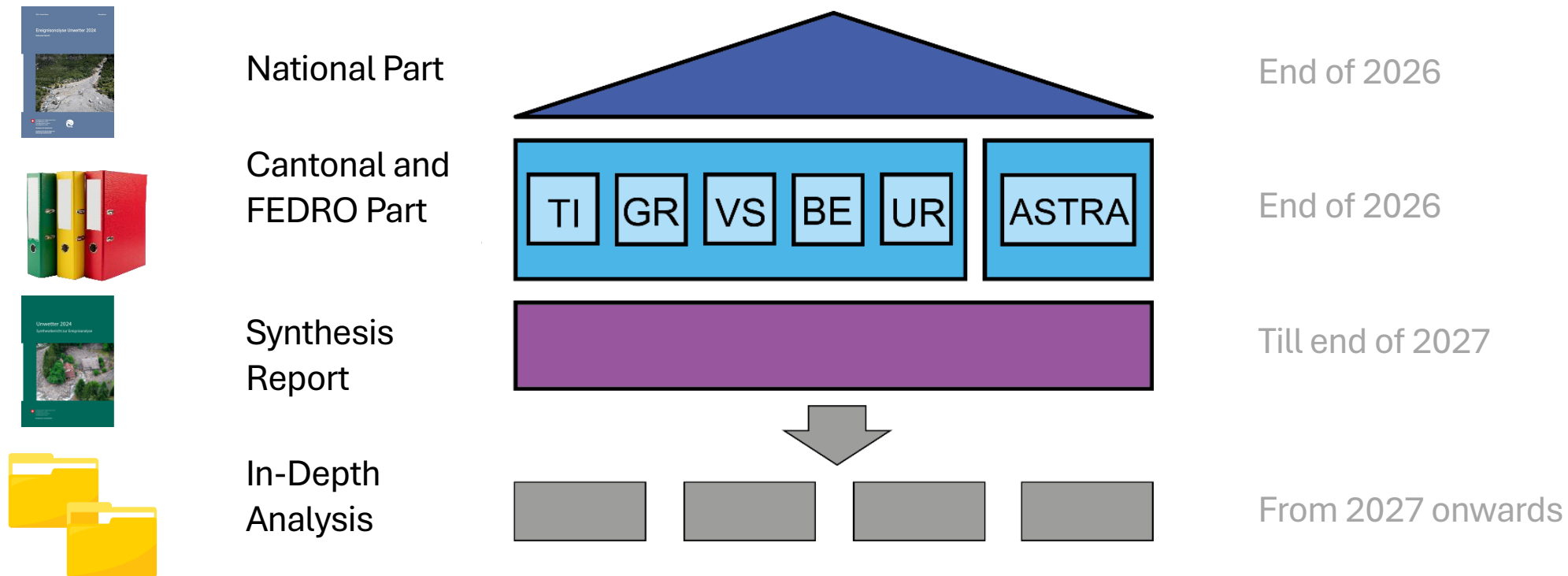


Governance of River Management in Switzerland

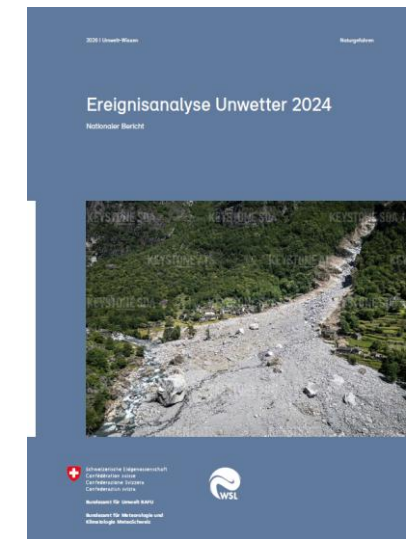
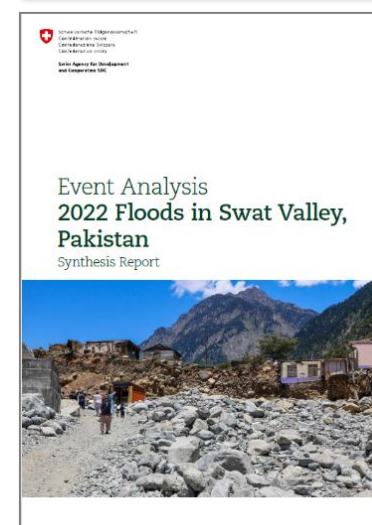
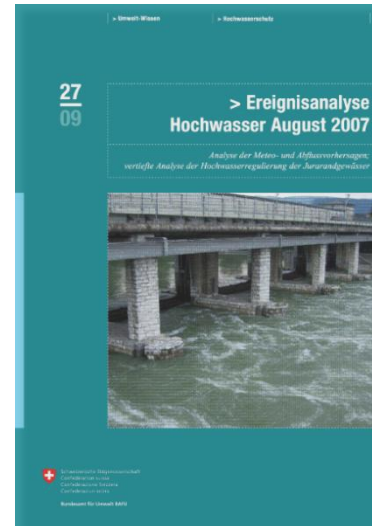
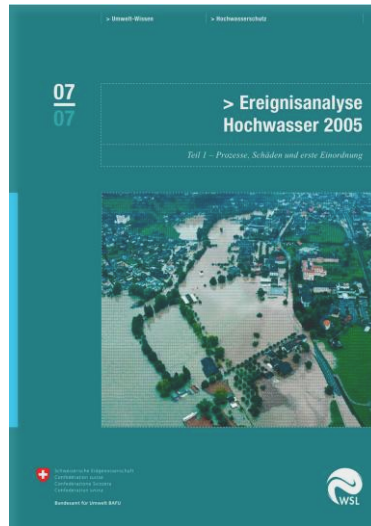
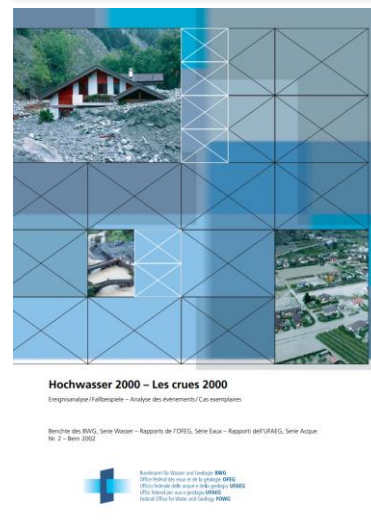
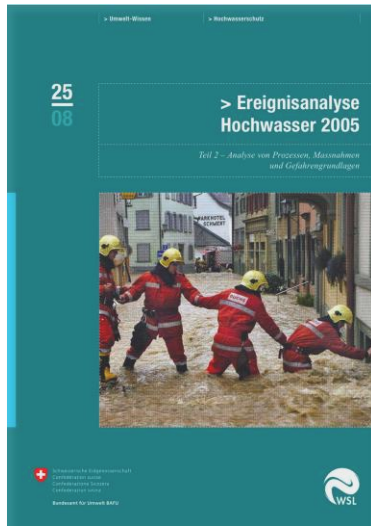
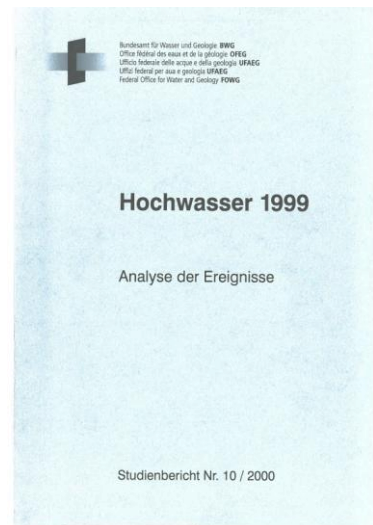
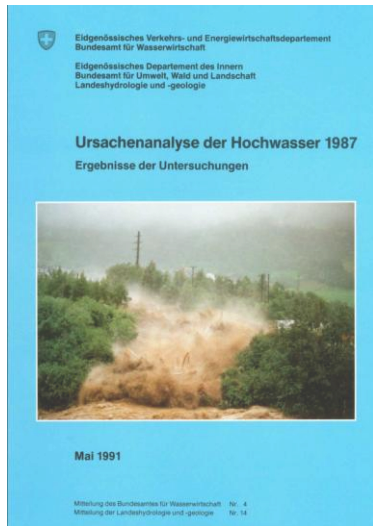




Concept Event Analysis 2024

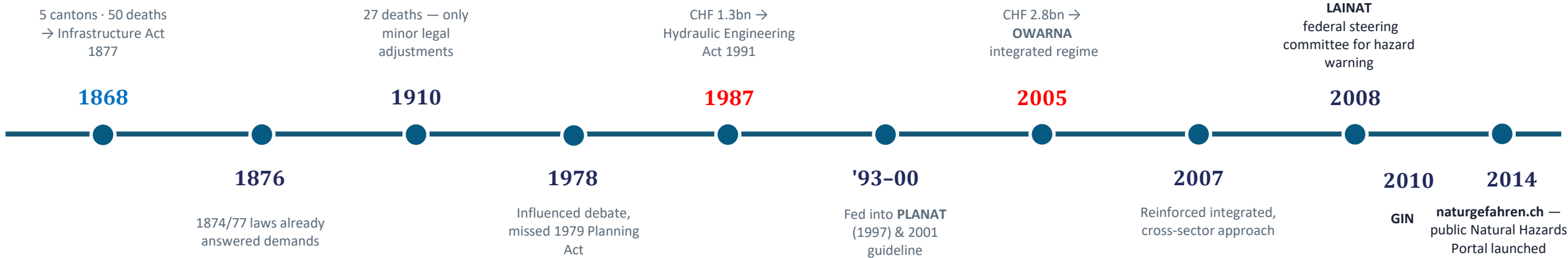


Analysing events in order to learn from them





Past event analyses and what they triggered



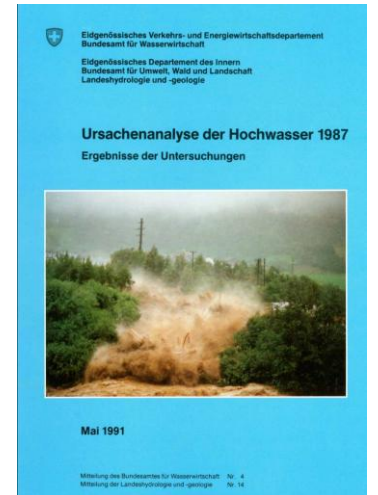
- **1999/2000 floods** - Contributed to establishing [PLANAT](#) (the national natural hazards platform) in 1997 and new flood-risk-management guidelines in 2001 promoting an integrative approach across flood management, water protection, and water use.
- **LAINAT** was founded in 2008 to optimize, coordinate, and harmonize early forecasting and public warning systems regarding natural disasters in Switzerland.
- **Natural Hazards Portal** (2014) is jointly operated by various federal agencies - including MeteoSwiss, the FOEN, SED, and SLF - to provide a unified map of weather extremes, floods, earthquakes, avalanches, and forest fire risks.



1987 flood and Event Analysis

1987 flood - Caused about CHF 1.3 billion in damage and triggered debates on increasing the flood management budget and harmonizing legislation across hydraulic engineering, water protection, fisheries, and forestry.

→ Led to the 1991 Hydraulic Engineering Act, which prioritized spatial planning over pure technical measures.





2005 flood and Event Analysis

2005 flood (the flagship case) - The largest event in recent Swiss flood history, affecting most cantons with 6 fatalities and CHF 2.8 billion in damage. It's event analysis directly produced concrete institutional tools: the **OWARNA** project (optimization of warning and alerting systems) and the **GIN** platform (joint information platform on natural hazards).

→ The 2005 flood analysis concluded the existing policy direction was sound and reinforced the shift toward an "**integrated risk management regime**".





Key findings Event Analysis 2024

- Repeated lines of thunderstorms led to very large amounts of precipitation within a short period of time.
- In individual regions, the 6-hour precipitation totals reached return periods well in excess of 100 years.
- The large-scale development of the thunderstorms was generally recognized; however, the location and timing of the most intense precipitation remained uncertain until shortly before the event.
- Pre-existing soil moisture intensified runoff formation and flood hazard. Snowmelt played a varying role depending on the catchment area and could additionally intensify runoff.
- Identical precipitation amounts led to very different impacts depending on the antecedent conditions and runoff readiness of the catchment area.
- The uncertainties in the meteorological forecasts are directly transferred to the hydrological runoff predictions.
- Rare threshold processes can suddenly mobilize very large quantities of debris, thereby massively increasing the damage potential.



Event analyses in Switzerland

Turning Disasters into Institutional Learning

Thank you very much for your attention

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Sources

- Glaus, A., Gavilano, A., & Ingold, K. (2024). Under which conditions do extreme events support a paradigm shift? Studying focusing events during two centuries of Swiss flood risk management. *Regional Environmental Change*, 24(162).
- FOEN (2026). Naturgefahren: Zuständigkeiten — division of tasks between Confederation, cantons and municipalities. [bafu.admin.ch](https://www.bafu.admin.ch).
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- FOEN / WSL (2008). Synthesis Report on the Event Analysis: The Floods of 2005 in Switzerland; Bezzola, G.R. & Hegg, C. (2007, 2008). Ereignisanalyse Hochwasser 2005, Teile 1–2.
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Q&A

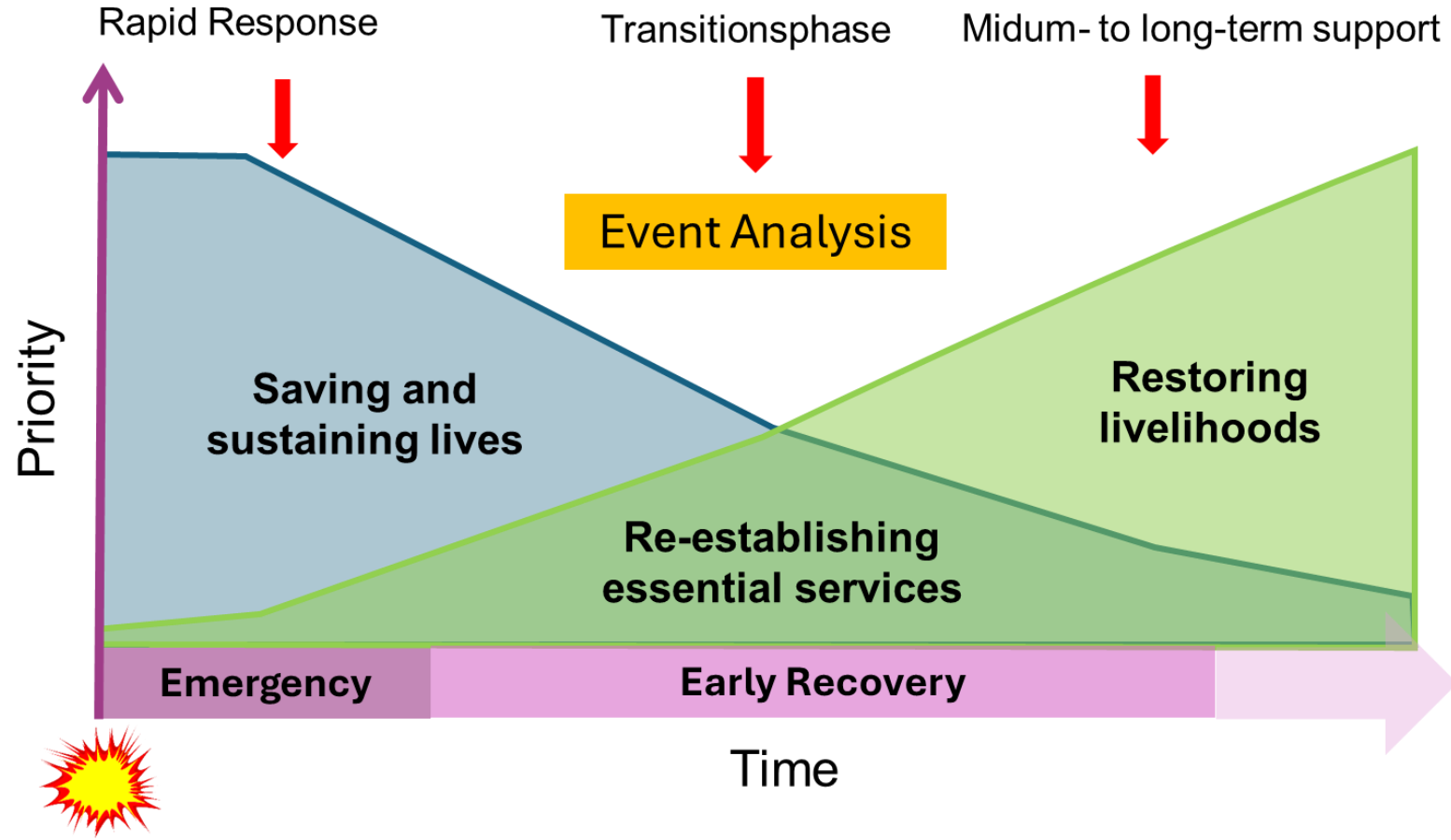
(comprehension)

The general processes that led to leveraging Swiss expertise for event analyses abroad

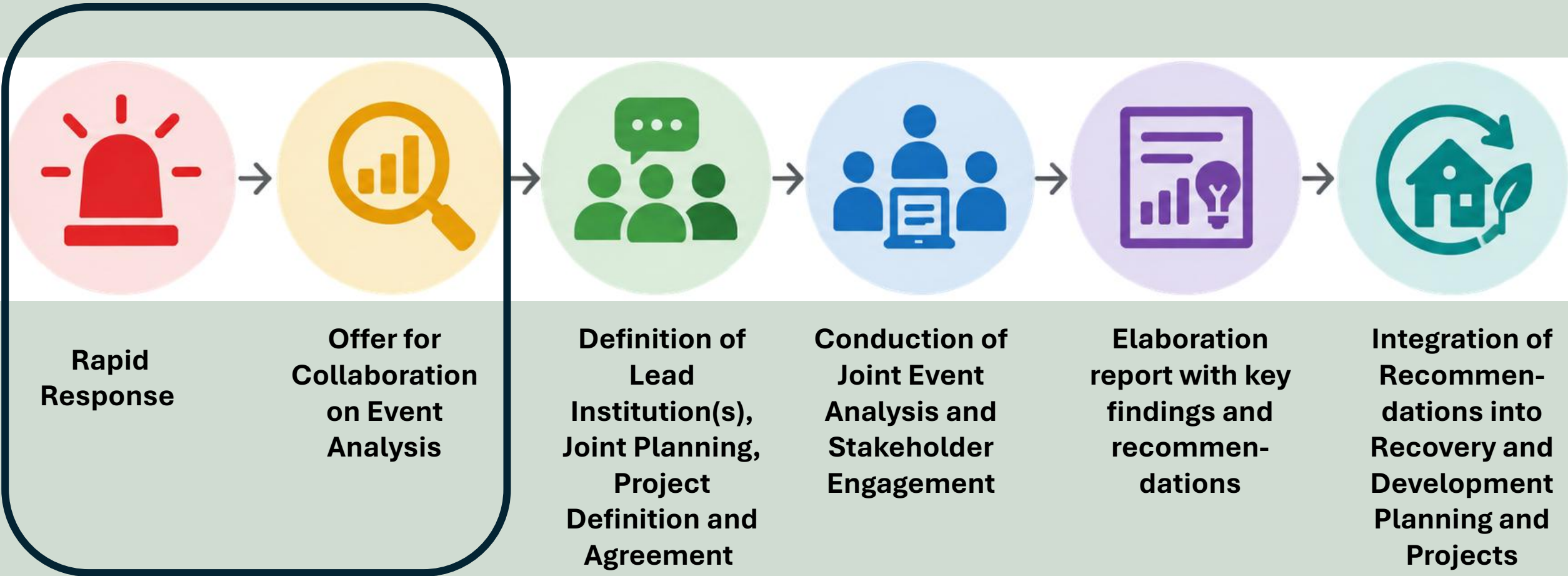
Regina Gujan

SDC

From Rapid Response to Build Back Better



From Rapid Response to Build Back Better



Ingredients for an Event Analysis



Local Ownership



Expertise and Experience



Access to area and data



Timing



Willingness to work with results



Small Budget

Event analyses in Pakistan and Armenia

Christoph Lehmann

Lehmann Hydrologie-Wasserbau



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Event Analyses in Pakistan and Armenia

Key Insights and Recommendations



Christoph Lehmann
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hydrology.ch

Bern, September 16, 2026



Event Analysis:

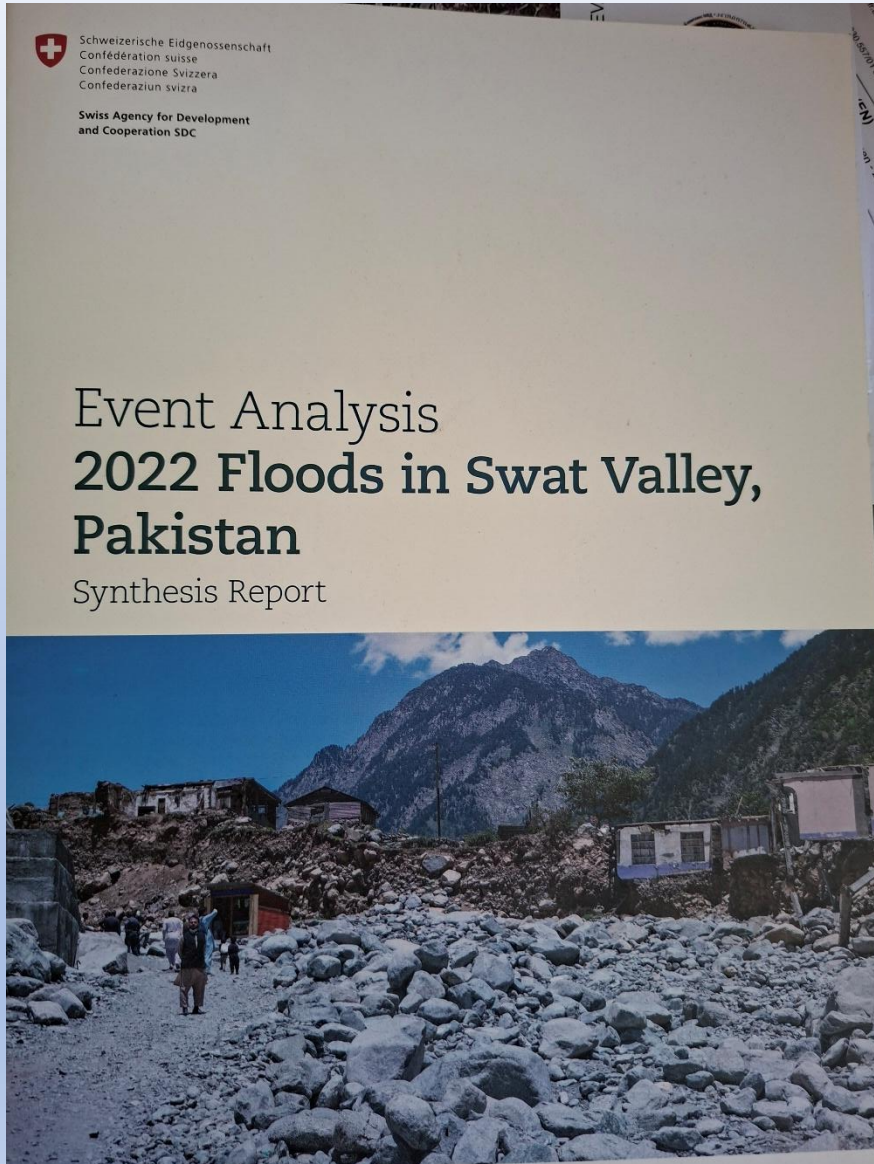
- Document the event (how did the event unfold?)
- Provide an overview of key processes and damage
- Identify the causes of the damage (which unfavorable factors had a negative impact?)
- Show what can be learned from the event
- Recommend DRR measures

Pakistan



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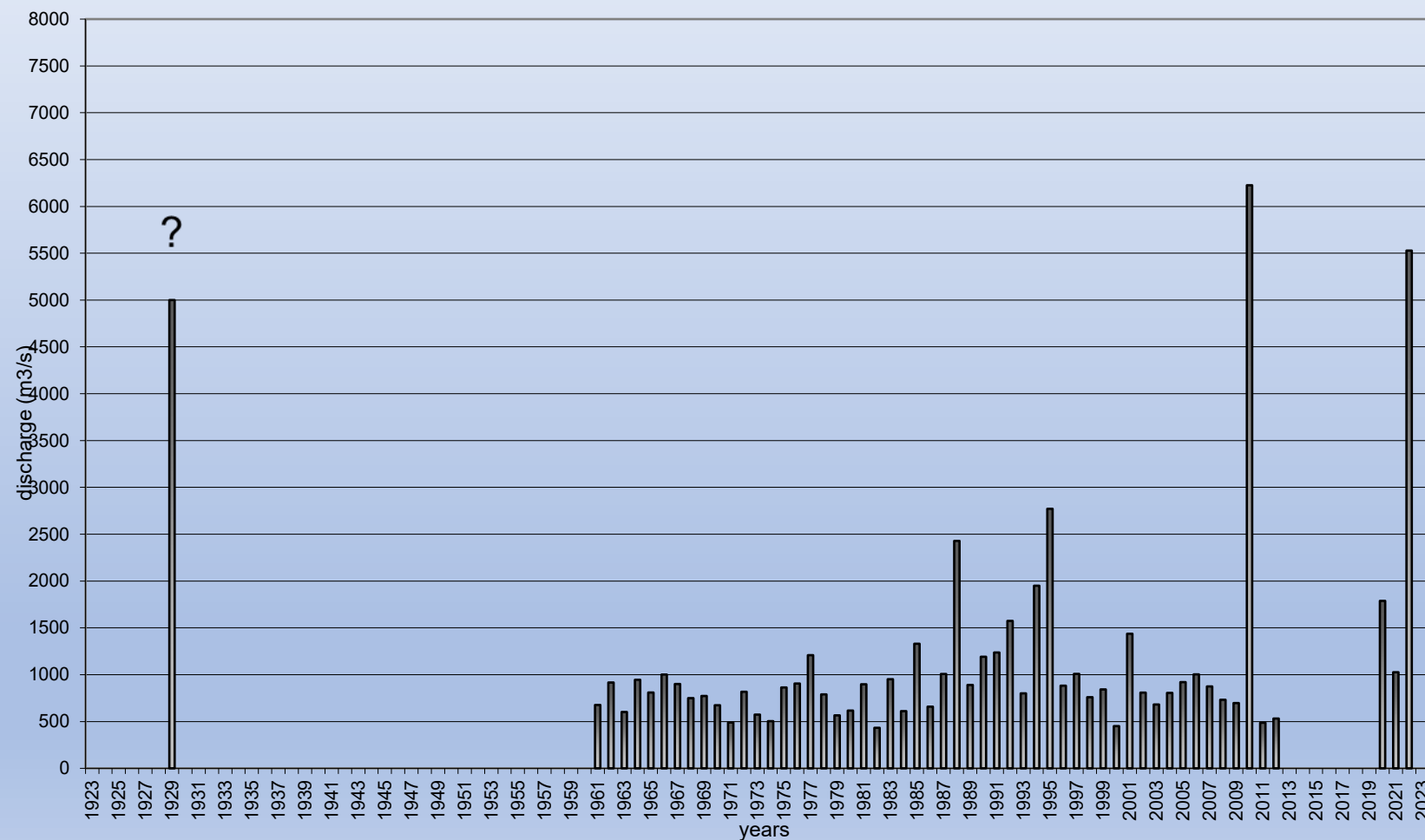


Annual peak discharge Chaktara 1961 - 2022 incl. flood 1929

1929

?

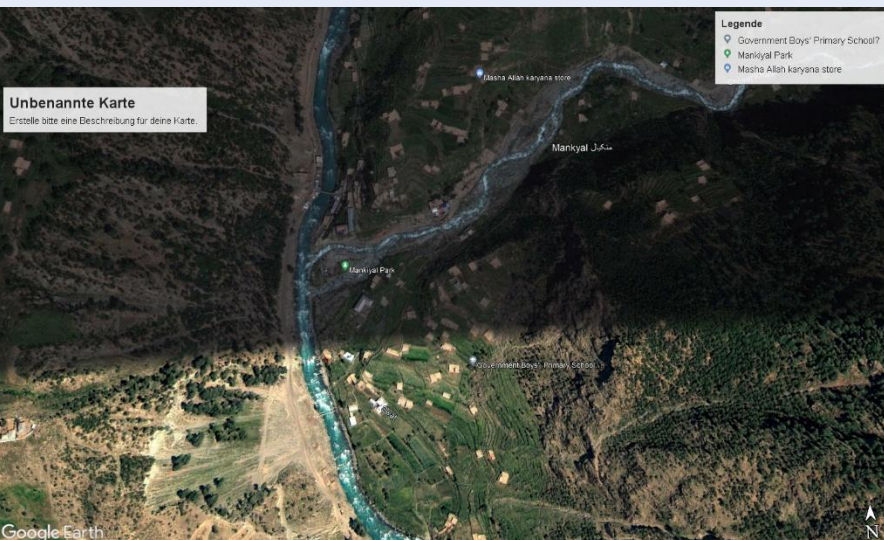
1961



3 large events

within 100 years

2009



2011

2017



2022

Construction of buildings with
protection wall at the riverbed
June 2023



Kalam before 2010



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Population pressure on flat terrain



“North-West Frontier Province Rivers Protection
Ordinance 2001” prohibits buildings near the river...

Kalam June 2023

Debris flows were responsible
for high sediment inputs



Upstream: Temporal dams
at different places



Downstream: Erosion
Road and buildings destroyed



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Aggregation of sediment in the
river bed



Unsufficient warning

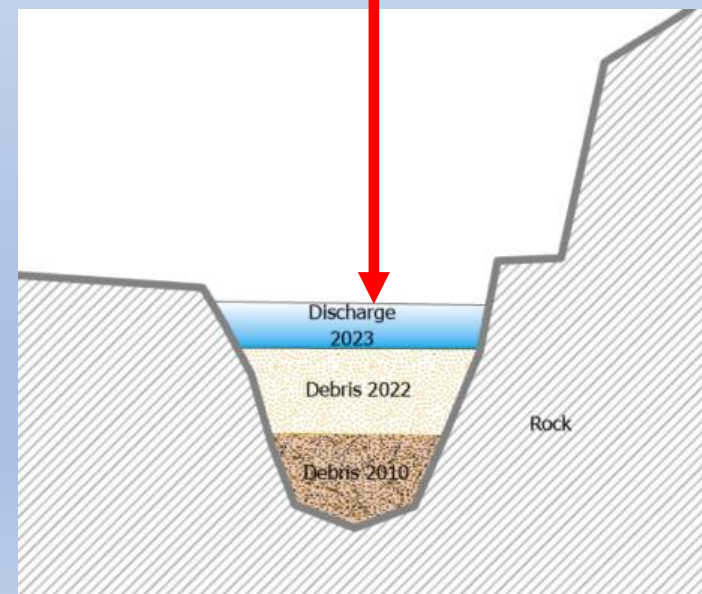
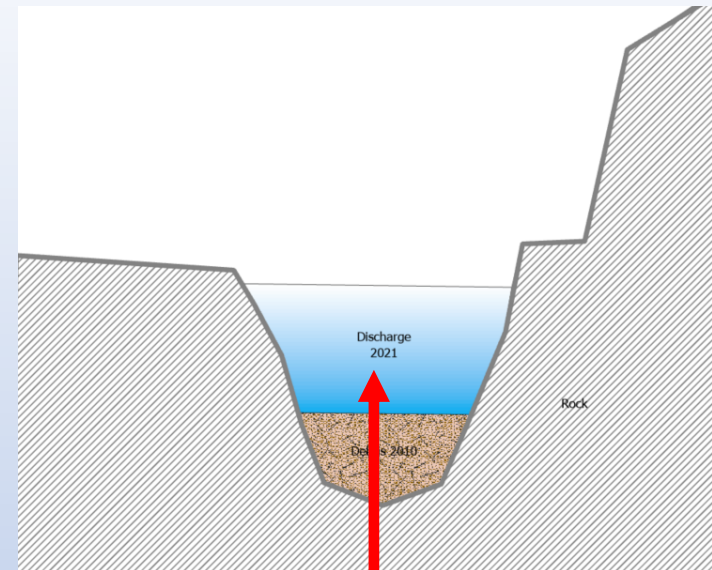




2004



2023



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Residual risk: high

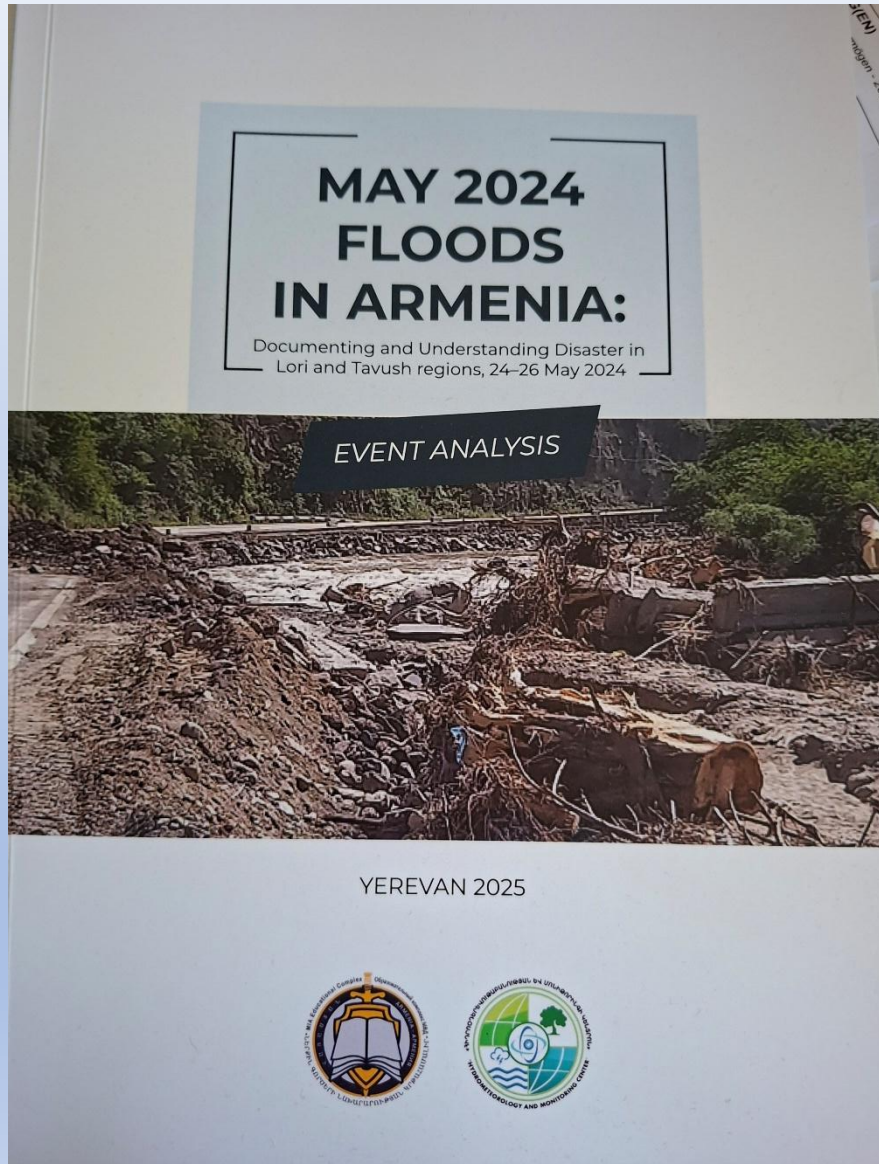
Climate change?

Armenia



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High sediment transport



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Construction at the river bed

Bridges



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Protective walls





What did we learn from both events?

1. Former events have influenced the event
2. High sediment transport caused damage and might influence river behavior in the future (→ residual risk!)
3. Human nature conflict is responsible for many damages (construction in flood prone areas)
4. Early warning was inadequate
5. Poor maintenance of constructions
6. Lacks in the implementation of constructions (bridges, walls...)
7. No evidence found of climate change



Recommendations

- Reliable data (hydromet network, availability)
- Early warning systems
- Capacity building and exchange of know how (fluvial morphology, adapted engineering etc.)
- Multiple hazard risk mapping including scenarios of climate change (spacial planning)
- Enforcement and compliance with existing laws
- Provide additional funds for the maintenance of endangered structures such as bridges, protective walls etc.

Q&A

and discussion

UNDRR perspectives on using After-Action- Reviews to enhance readiness for disaster recovery

Emilia Wahlstrom

United Nations Office for
Disaster Risk Reduction
(UNDRR)

Using After-Action-Reviews to enhance readiness for disaster recovery

Webinar on Event Analyses in Integrated Risk Management/ DRM

16 September 2026



UNDRR

UN Office for Disaster Risk Reduction



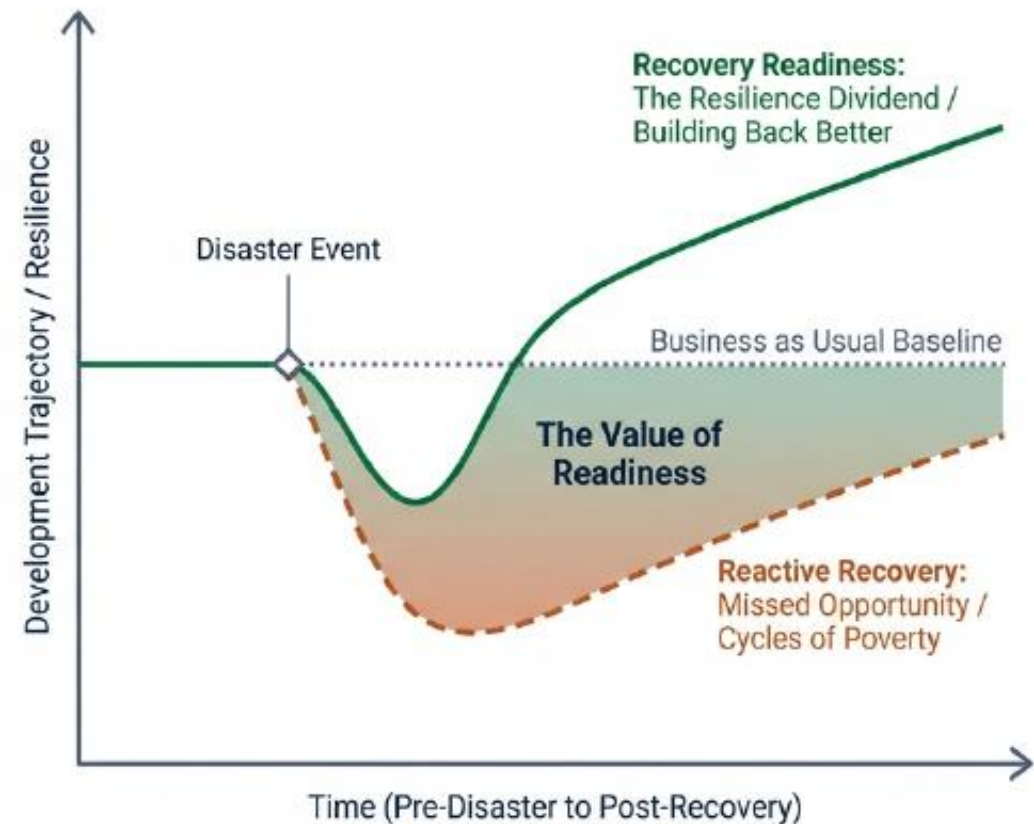
SENDAI FRAMEWORK

FOR DISASTER RISK REDUCTION 2015-2030

Reactive Recovery vs. Ready Before

- Disasters are becoming more frequent and severe. In 2023 alone, 399 disasters killed over 86,000 people and caused USD 700 billion in infrastructure losses.
- Challenge: When institutions improvise, recovery is delayed, inequitable, and inefficient. The window of opportunity for political change closes before planning is done.
- **Recovery Readiness** – pre-disaster governance, financing and capacity that allows governments to seize that narrow window.

The Window of Opportunity



How does UNDRR assess recovery readiness?

Governance

Institutional arrangements, legal mandates, coordination for recovery

Finance

Pre-arranged financing, disbursement systems, financial management

Capacity

Technical expertise, operational readiness, housing and infrastructure

Data & Knowledge

Baseline data, damage tracking, monitoring and learning systems

The Recovery Readiness Framework and Assessment Tool (RRFAT)

provides governments with a practical approach to assess their recovery readiness across four domains and ten measurement areas.

The Framework is government-led and validated, enabling governments to identify gaps and prioritise improvements before disasters strike.

Findings from Recovery Readiness Assessments



RECOVERY IS LESS INSTITUTIONALISED

Response systems are often stronger than medium- and long-term recovery arrangements. Systems not sufficiently connected.



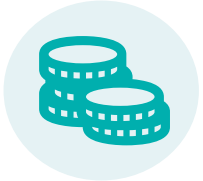
TRANSITION FROM RESPONSE TO RECOVERY

Leadership, planning and financing and coordination often become less clear after the emergency phase.



LOCAL ACTORS CARRY THE BURDEN

Municipal and district authorities often face limited technical, financial and institutional capacity.



FINANCING REMAINS REACTIVE

Reliance on reserve funds, reallocations and post-disaster decisions remains common.



PARTICIPATION IS NOT EMBEDDED

Community, accountability and private sector engagement rarely institutionalized before disasters.

Recovery remains one of the least institutionalised components of DRM

After-Action-Reviews for Recovery

Why?

- Provides evidence from real recovery experiences, rather than relying on government plans and procedures “in theory”.
- Complements a formal assessment, providing an opportunity for voices to be heard that may not have a space in formal reviews, e.g. women, migrants, persons with disabilities

How?

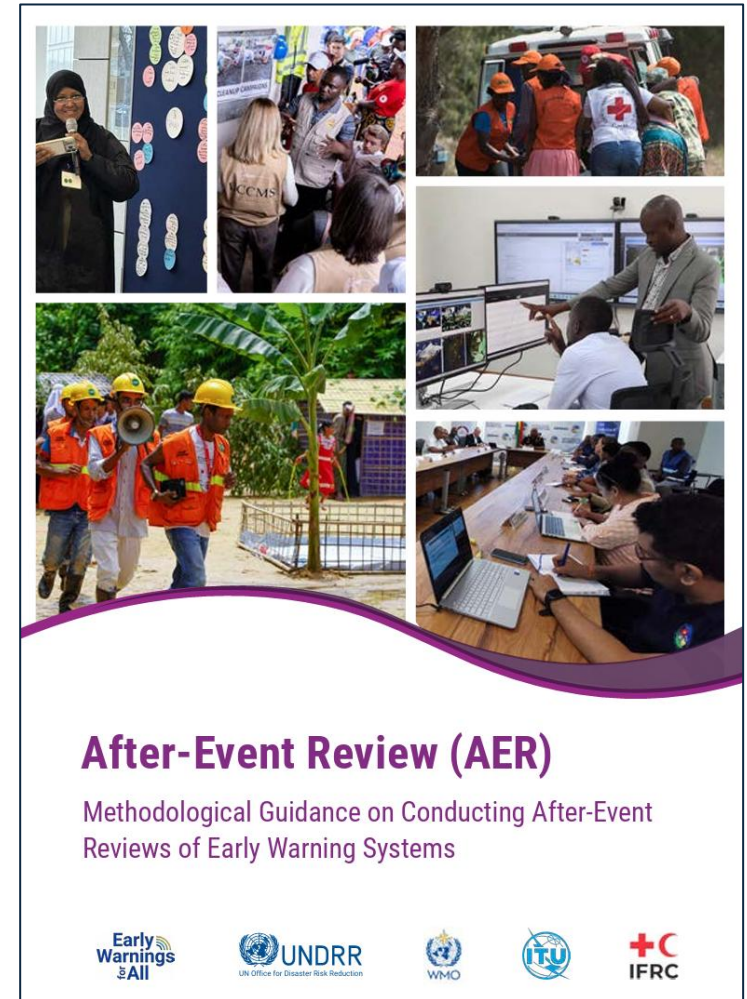
- Exchanging experiences between countries through a Community of Practice
- After-Action-Review methodology under development by the Asian Disaster Preparedness Center (ADPC) to be issued under the **International Recovery Platform**



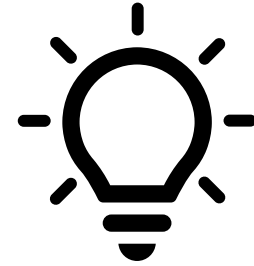
Housing damage following mudslides in Issyk-Kul region, Kyrgyzstan

Related initiative: After-Event Reviews of EWS

- Focuses on how Early Warning Systems performed
- Examine the full warning chain: monitoring, forecasting, warning dissemination, coordination and response
- Focus on learning and improvement
- Helps identify gaps in risk knowledge, communication, inclusivity and institutional coordination
- Generates actionable recommendations



Summary



No One-Size-Fits-All Approach

- Consider the **purpose** and the **national context** within any review/analysis
 - Different reviews have different objectives and answer different questions of DRM: understanding underlying causes of disasters, assessing Early Warning System performance, or evaluating recovery outcomes
 - We should look beyond **what** happened to understand **why** it happened (this gets tricky when considering underlying institutional, social, financial, governance and political factors)
 - Successful review processes share common principles: **evidence**, **participation**, **learning**, and **continuous improvement**
- the review is not an end to itself, but **stronger DRM systems**, **better decisions**, and **greater resilience** before the next event!



Thank you!

For any questions do not
hesitate to be in touch!

Emilia Wahlstrom
wahlstrom@un.org

Q&A

and discussion

Take home messages

Poll

Let us know what you thought
about today's webinar in the
chat

WRAP UP



THANK YOU

To all participants,
speakers and co-organizers
for making this event
happen.



JOIN US NEXT TIME

Don't miss the next webinar on **“Corruption and
multilateral climate funds”**

24 September, 12:00 – 13:30 CEST

Online event

<https://www.sdc-cde.ch/en/events>



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Organisers & speakers: please remain online for a few minutes

