After the flood is before the next flood – the post event review capability of the Zurich flood resilience alliance. Insights, recommendations and next steps for future flood prevention

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INTRODUCTION

As part of Zurich's Flood Resilience Program, the Post Event Review Capability (PERC) researches and provides an independent review of large flood events. It tries to answer questions of what aspects of flood resilience, flood risk management and catastrophe intervention have worked well (identification of best practice) and where opportunities for further improvements lie. Since 2013, PERC has analyzed various flood events, has been in dialogue with authorities and has started consolidating the knowledge and making it available to all those interested in progressing flood risk management. PERC overall aims to thoroughly examine aspects of flood resilience, flood risk management and catastrophe intervention in order to help build back better after events and learn for future events. As our research from post event analyses shows a lot of losses are in fact avoidable by taking the right measures pre-event and these measures are economically efficient with a return of 4 Euro on losses saved for every Euro invested in prevention on average and up to 10 Euros for certain countries. The PERC approach provides an analysis of risk factors leading to, increasing or reducing flood losses. PERC identifies elements that worked well in terms of reducing flood losses and aspects that increased losses and where more needs to be done along the entire flood risk management cycle to effectively reduce loss. With this concept now matured, we present the findings and a manual for how PERCs can be conducted.

UNDERSTANDING RISK FACTORS THAT LEAD TO FLOOD LOSSES

We analyze the precursors leading up to significant flood events in the countries that the Flood Resilience Alliance has been active both in developed as well as in developing regions, comprising floods in Austria (2013), Germany (2013), Morocco (2014), Nepal (2013, 2014), Switzerland (2014), Thailand (2011), the United States (2012) and others. From precipitation to the actual flooding, we analyze what happened during the floods and why. Key questions we asked revolve around which protection and risk reduction approaches worked well and which did not, and why.

INSIGHTS AND RECOMMENDATIONS FROM THE POST EVENT REVIEW ACTIVITIES

Although PERC has operated in a variety of countries reviewing a range of very diverse flood events, patterns are emerging that highlight which aspects of flood risk management and flood risk reduction tend to work well operationally, and which tend to typically go wrong. As part of the ongoing effort of PERC, we report on the factors we found need more attention if flood risk is to be reduced over time, and which are good cases for best practices that can and should be encouraged to be shared. Examples of those include:

- what if yet another „100-year flood" happens soon after the first one- risk perception and understanding of risk in the population
- Drivers for motivation of flood prevention and blockages - why people tend not to invest enough in prevention, and how to make the case

for better prevention.
- Residual risk and the levee shadow effect - why the population tends to „feel safe“ and not act when necessary
- What is the overload case and how to implement it effectively in flood protection systems?
- Decision-making for the future under uncertainty - how to design to acceptable flood protection levels if we haven‘t seen yet what‘s physically possible.

HOW TO PROTECT - PRACTICAL EXAMPLES

Finally, we outline practical examples for reducing the loss burden and risk over time.
- „Flood protection hierarchy“ - from location choice under a hazard perspective to mobile flood protection.
- Risk-based approach and identification of critical infrastructure.
- Integrated flood risk management (IFRM) in theory and practical, operational application of IFRM.
- The role of the insurance industry in society to work together with other institutions to promote prevention and help reduce risk and overall flood losses.

CONCLUSION

We have now mature evidence how PERC can be successfully applied in both developed and developing countries around the world and encourage others to use this approach to develop best practises regarding Flood Resilience and pre-event mitigation, and potentially expand this concept to other perils as well.

KEYWORDS

flood resilience; post event review ;integrated flood risk management; prevention; flood risk reduction

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