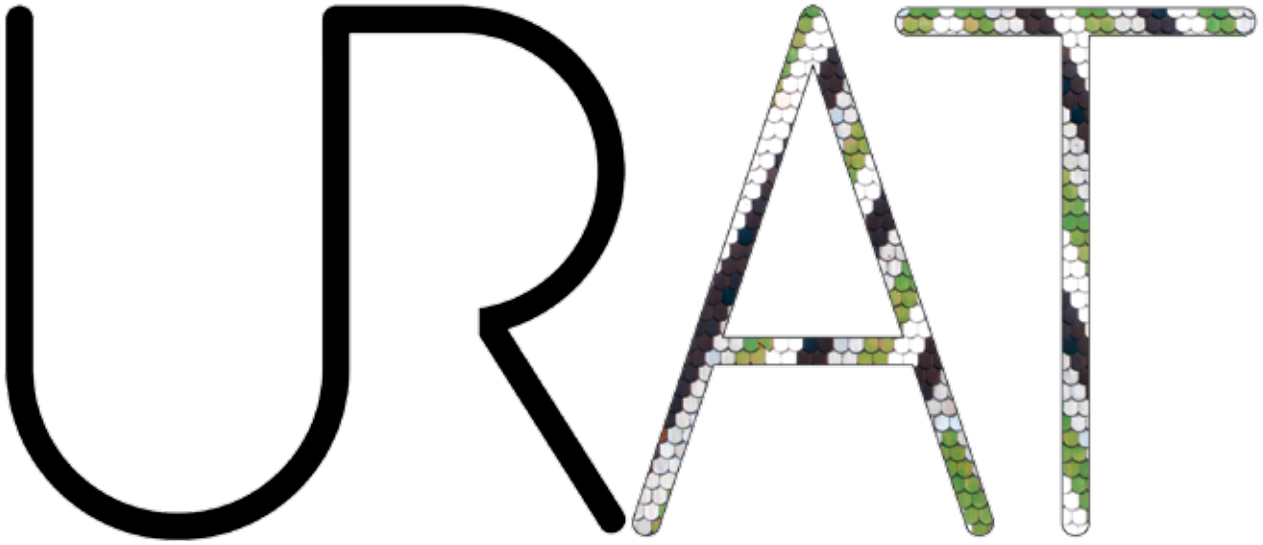

Understanding Risk

Proceedings from UR Austria

Organized by:

ZAMG | GFDRR Global Facility for Disaster Reduction and Recovery | WORLD BANK GROUP

In collaboration with:

alp.S | BMF Bundesministerium für Finanzen | BM.I Bundesministerium für Inneres | International Institute for Applied Systems Analysis IIASA | RIOCOM | Risikodialog | Stadt Wien | universität wien | UNI GRAZ

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Washington, D.C., December 2016
Designed by Miki Fernández (miki@ultradesigns.com), Washington, D.C.

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Acknowledgments

We would like to thank all of those who participated in, attended, and contributed to the Understanding Risk Austria Conference (URAT). This was the first Country conference of a developed country and Austria didn't disappoint! While we cannot mention all the institutions and individuals who contributed to the planning and execution of the event, we would like to highlight some key partners. First, we would like to thank our organizing partners: Zentralanstalt für Meteorologie und Geodynamik (ZAMG), The World Bank, and the Global Facility for Disaster Reduction and Recovery (GFDRR). We would also like to give a special thank-you to all the organizations that led the policy, technical, and training sessions, Austrian Ministry of Finance (BMF), Austrian Ministry of Interior (BM.I), alp-S, Riocom, Risiko:dialog, Wegener Center, Uni Graz, Stadt Wien, International Institute for Applied Systems Analysis, Universitat Wien, and the Austrian Ministry of Life.

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The URAT core team, Michael Staudinger and Joaquin Toro

Foreword

The first edition of the Understanding Risk Austria Conference (URAT) was an unquestionable success, bringing together for the first time policy makers, risk modelers, insurance, risk communicators, academia, and practitioners (private and public sectors) from all the corners of Austria to meet, learn, and share best practices in disaster risk management and adaptation to climate change.

The upcoming Austrian national ISDR Platform and the World Bank provided the basis for the organization and creative interaction of different ministries, federal governments, scientific institutions and actors from the private sector.

During January 20th and 21st of 2016, the city of Vienna hosted the first Understanding Risk Conference for a developed country, URAT. The event was hosted with all the elegance and charm of a city that breads culture and at the same time that has suffered from flood disasters in the past. The City Hall or "Rathaus" hosted the Opening Ceremony and the URAT Ignites. The next day we moved to the "Vienna Old Stock Exchange", where the eight sessions took place. Almost 300 people participated of the two day event where the talent and expertise of Austria's communities, scientists, technologists, NGO's, private sector and government to develop shared understanding of the challenges we face in building long-term resilience to natural hazards; the impacts of climate change; and develop innovative solutions to meet them.

Probably the builders of the St. Stephen's Cathedral in Vienna must have been cognizant of the country's exposure to floods, landslides, and avalanches and other natural hazards when building this impressive site. The pattern of the roof tiles resembles earthquake waves, the snowy mountains, and the rivers around cities. Maybe, when you live in a country that understands its risks so well, you never stop to put much thought into the efforts that national, regional, and local governments do to reduce this risk. Austria's knowledge and experience in dealing with disaster reduction is impressive, and we hope that with initiatives like the Understanding Risk Forum, this can be shared internally and even more widely.

Photo credit: Joaquin Toro

Innovations in Multi-Hazard Warning Systems

Background/ introduction

There have been very significant advancements in multi-hazard warning systems over the last five years, opening new areas of user orientation. Crisis situations require a holistic approach in order to assess a scenario in all its possible consequences: how will people be affected, how can they be most effectively reached, and which reactions by authorities and individuals can minimize damage to life and property. Despite good collaboration between Austria's relevant partners, multi-hazard warning systems in Austria are at present only partly implemented in a consistent way. For example, different regions use different technical mechanisms to convey warnings; a system with a universal approach is lacking. In addition, resilience to extreme events exists at some level for natural hazards, but has to be developed for aspects like ground erosion. Learning from other countries and introducing innovative methods and best practices could therefore be very helpful for Austria's authorities tasked with warning for extreme natural and other hazards and risks.

Challenges/questions

In order to set up an efficient multi-hazard warning system in Austria, cooperation between the different actors needs to improve significantly and technical innovation is needed in various ways. Bringing together different partners helps define interfaces and areas of competence, but also fosters understanding of the limitations of each entity, for example, in terms of the reliability of information at any given moment during an evolving crisis. A special challenge facing Austria is reaching people visiting from outside Austria who have little or no skills in the local language or knowledge of local warning systems. A common warning system across Europe is a necessity given the continent's annual influx of 25 million tourists. Therefore, reaching users in a consistent way with different technical means for various information platforms poses a technical challenge not easily overcome, as different systems are employed at present by federal and local authorities in Austria.

Presentations

Paul Davies (UKMO) – "The UK National Hazard Platform - Experiences and Challenges"

The 2007 floods in the UK caused Euro 3,7bn in damage and prompted an independent review, which led in subsequent years to more cooperation between entities involved in warning for natural and technical hazards and risks and the Flood Forecasting Centre (FFC). The FFC, jointly operated by the Environment Agency and the UK Met Office, is located in Exeter within the Met Office infrastructure. The FFC integrates meteorological information with hydrological data and publishes this information over a five-day warning period. For other hazards, the National Hazard Partnership was established in 2011 under the jurisdiction of the Cabinet Office to extend coverage of the range of hazards beyond meteorology to volcanic ash, space weather, landslides, forest fires, and air quality. This cooperation has yielded better-informed mitigation and adaptation strategies for the institutions involved and has also provided capacity to address linked and compound hazards. Bringing together institutions of various backgrounds to operate in coordination requires patience, mutual understanding, and a certain amount of resolve and

Photo credit: Paul Gilmore

courage to address new and unforeseen challenges.

Michael Staudinger (ZAMG) – "Which Warnings Work?"

Warnings for natural and technical hazards are in most cases formulated by scientists, who have to combine a plethora of information into a single accessible and understandable phrase. Users often feature too little in this discussion. The European warning platform MeteoAlarm, operated by EUMETNET, provided an opportunity to debate and define the prerequisites of effective warnings to be used in 36 different nations. A simple, four-level colour code for describing damage and advising action proved to be the best solution to achieve a meaningful response by the public in case of rare events with high damage implications. In these cases memory of past events are little helpful as 100 years events transcend clearly the experience of individuals and people have to be ready for extraordinary measures to be taken.

Chris Renschler (SUNY Buffalo) – "Peoples' Resilience: Scenarios as Basis for Multi-Hazard Warnings"

Changing precipitation patterns are causing all types of impacts like landslides, floods, avalanches, and soil erosion. The last, in particular, can create a continually deteriorating condition for agriculture, forestry, and infrastructure. In order to model the effect of this phenomenon of changing precipitation patterns a broader perspective is needed to understand all possibilities for increased resilience. This process has to include population dynamics, ecosystem services, organized government services, physical infrastructure, and economic, social, and cultural services.

Warnings for natural and technical hazards are in most cases formulated by scientists, who have to combine a plethora of information into a single accessible and understandable phrase.

Hans-Gerrit Möws (BBK) – "The Modular Warning System (MoWas)"

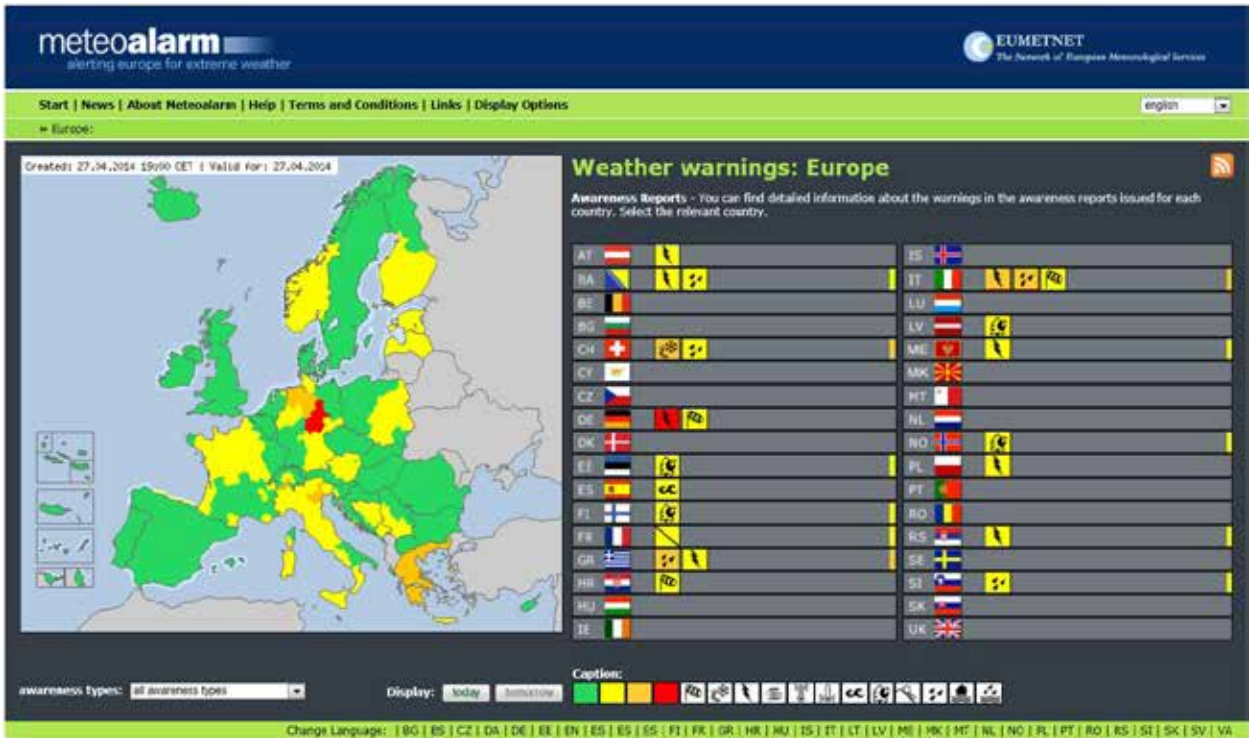
Germany places responsibility for crisis management at the federal level (as do many other countries), which creates challenges in reaching responsible authorities and individuals in a coherent and well-structured way. Given those challenges, the Federal Office of Civil Protection and Disaster Assistance deployed the MoWas system at the federal and state level. At both levels, the system can issue geo-referenced warnings that are then transmitted via satellite in a matter of seconds to radio, TV, paging systems, the Internet, and Deutsche Bahn AG's loudspeaker system and can be distributed to a wider network from there.

Ortwin Neuschwander (Fraunhofer-Institut) – "KatWarn: Technical Possibilities of Warning Systems"

The KatWarn system uses the capabilities of GPS-located smartphones to disseminate official warnings and alerts to users in the general public in two ways: one, via an App, allows a user to receive warnings from 7 different locations, or two, a feature called Guardian Angel, which finds and retrieves warnings for the current location of the smart phone. For the issuer of the warnings, the program is very easy to operate, since a polygon and pre-texted messages can be compiled in very short time. Additional triggering for sirens, TV sets, SMS, public displays, and control of infrastructure can be added to the system. KatWarn is funded by the insurance industry and has at present more than 1 million users.

Conclusions

The existing multi-hazard warning systems used in UK and Germany, as well as the challenges they face, are very relevant to the Austrian situation. Thus, they can provide examples of best practices, which could be incorporated into Austria's system. Cooperation between different authorities working on crisis prevention and crisis management in Austria has to be intensified; scientific institutions can help by catalyzing the innovative processes needed to achieve accurate warnings and alerts for climate and hazards altered by climate



change. This process requires a new coordinated strategy between actors on national, sub-national, and local levels and a cross-sectorial approach concerning various hazard scenarios. This would produce better understanding of complex and fluid damage scenarios and more appropriate responses by all administrative levels involved. As the discussion during the session showed, heat warnings as well as measures to mitigate the effects of heat, are deficient at present in Austria.

To understand the risk in a given situation, levels of vulnerability and exposure have to be known; a people-centered approach to increase resilience includes therefore more than just natural science. It also has to include economic and social perspectives and the capacities and competencies of communities, which often go underestimated.

A well-structured process to disseminate warnings is equally important. To effectively reach the various types of warning users, precise user-oriented language is more needed than ever, as the responses needed in extreme situations are not comparable to normal adverse situations. The use of the 4-level danger scale employed across Europe offers a good model where a situation of rare hazard with very serious consequences can be well-differentiated against other hazard levels, which may also cause damage, but occur more frequently. New technical systems like Germany's KatWarn should be tested and evaluated for use in Austria as well.

Community-level Risk Management

Reinhard Mechler, IIASA
Michiko Hama, alpS
Oskar Januschke, Stadtgemeinde Lienz
Ina Meyer, WIFO
Paul Dobersberger, alpS

Background/ Introduction

Disaster risks are on the rise. While there are considerable uncertainties regarding the exact contribution of anthropogenic climate change to disaster risk and related impacts, increasing losses from extreme events – globally and in Austria – show the need for comprehensively addressing climate-related risks at multiple levels. Among potential responses, an increased focus on linking climate change adaptation (CCA) and disaster risk reduction (DRM) is called for. In addition, innovative partnerships between research, public, and private sectors as well as civil society organizations are needed. This session focused on research about community-level disaster risk management in Austria and relevant policy and practice insights from that research with a view towards identifying useful methods and tools to inform local action.

Key Challenges/ Questions

Key challenges and research questions addressed in the session include:

- What are necessary multi-actor partnerships for managing increased disaster risk at local levels?
- What are the main impacts of climate change and socio-economic changes that affect communities and municipalities in Austria, in particular, the city of Lienz?
- What are useful and scientifically rigorous tools and methods that can inform local policy formulation and action on local scales?
- How are the risks and associated impacts changing over time?
- How can global climate risk tools be adapted to the local level in Austria to serve as a decision-support in adaptive and iterative risk management?

Summary of Presentations

Oskar Januschke (City of Lienz) – "The 'Making Cities Resilient Campaign' – Moving the City of Lienz Towards Resiliency"

This initial presentation discussed work undertaken by the city council of Lienz in the area of risk management that earned it an award under the UNISDR 's 'Making Cities Resilient Campaign.' In addition to highlighting the individual steps taken by the municipality, which ultimately led to the award, the talk outlined the continuing efforts to increase the resilience of the urban community. The presentation covered the initial assessment of the current risk situation, comprehensive risk management, and risk monitoring measures.

Ina Mayer (WIFO) – "'Local Reasons for Concern' - a Process-Oriented Approach to Climate-Sensitive Risk Management"

Building on the efforts undertaken by the City of Lienz (Tyrol), the

Photo credit: Joaquin Toro

ARISE research project developed a decision-support system for informing climate-sensitive iterative risk management for use at the local level. Designed as an adaptation approach, it builds on the IPCC's "Reasons for Concern" concept, which divides global climate change-related risks into five categories to inform global mitigation policy. This integrative concept has received a great deal of attention from global policymakers, but has not been tested for its applicability at local levels in informing climate adaptation and risk management strategies and implementation. The project ARISE addressed this gap by developing and testing a generic, participatory approach organised jointly with key stakeholders in the City of Lienz around "Local Reasons for Concern" (LRC). This scenario-based, pro-active risk management approach is contributing to building long-term resilience at the local level by helping local decision-makers identify key climate-related risks and plan effective, efficient, and locally-acceptable adaptation and risk management measures.

As one important outcome, the cooperation between practitioners/decision-makers from the City of Lienz and the Tyrolean Regional Government and scientists from the ARISE project and elsewhere helped close the gap between practitioner and scientific disaster risk reduction (DRR) and climate change adaptation (CCA) communities. The LRCs hold high potential to serve as a communication and decision-support tool by creating a sense of stewardship and ownership about existing and emergent climate-related risks. It enabled local stakeholders to draw from existing iterative risk management and adaptation concepts, as well as to co-design new such concepts, in order to reduce the risks aggravated by climate change and socio-economic development and therefore, contribute to building resilience at the local level. Highlighting the most relevant climate-related risks at the municipal level through the use of the LRCs addresses a critical gap; with the additional actionable input produced, local governments are able to choose from a variety of available and novel adaptation measures and tailor those accordingly to specific requirements.

An element of the program is forensic analysis, i.e.. the near-term identification of factors at local levels which decisively influence disaster events and impacts.

Reinhard Mechler (IIASA) and Michael Szönyi (Zuerich Insurance) – "Flood Resilience Alliance in the D-A-CH and other Regions: Results and Implications of the 'Zurich Community Flood Resilience Alliance'"

The Zurich Flood Resilience Alliance is an action-oriented, multi-partner program operating globally to strengthen the resilience of communities against flooding. An element of the program is forensic analysis, i.e.. the near-term identification of factors at local levels which decisively influence disaster events and impacts. The forensic analysis (termed Post-Event Review Capability - PERC) has so far been applied in a number of case studies, including the large-scale flooding in 2013 in Austria's DACH region. This presentation discussed factors that decisively affected extent and damages in Austria relative to the experience in Germany and Switzerland. A comparable event had happened in 2002; yet, in the 2013 disaster, the overall inflation-adjusted losses were much lower than in the earlier event (Euro 0.9bn vs. 3bn). Analysis done by the Zurich Flood Resilience Alliance with IIASA identified the following success factors, which helped to avoid some, but not all of the losses - there is no perfect protection against large-scale disasters:

- **High-risk awareness.** In Austria, particularly in lower Austria, it is common practice that municipalities, supported by relevant authorities, conduct a self-assessment of the risks they face. The risk analysis and training carried out is very participatory, involving subjective ranking by the municipalities and identification of key risks and actions.
- **Clear lines of responsibility within Austrian states.** A lot of effort has been invested into defining clear lines of

responsibility for dealing with flooding within Austrian states. Training at municipality and state levels has been extensive and has proved very effective.

- **Mobile dams made a difference** in the 2013 flood event and did not collapse when put to their first real test. Although expensive, these will be further raised, particularly in high-profile regions with some tourist appeal (such as in the Wachau).
- **Soft resilience measures**, such as keeping retention areas vacant, alongside hard-resilience solutions (dams) have been effective buffers against flooding.

Paul Dobesberger (alpS) – "How Resilient is My Community to Risks and Disasters? Findings from the DG ECHO Project CP Model

Within the framework of the CP Model project co-financed by the European Commission's Humanitarian Aid and Civil Protection Department (DG-ECHO), partner organizations from Greece, Italy, Spain, and Great Britain developed a method to measure the resilience of communities against crises and disasters. On the basis of a self-assessment of the municipality by means of a standardized questionnaire, resilience was assessed in the fields of disaster preparedness and disaster relief and assessed with regard to various attributes of resilience. These attributes are defined as reflexivity, robustness, redundancy, flexibility, resourcefulness, and inclusion.

Conclusions

In part due to the research and practice efforts discussed here (including innovative partnerships, models, and tools), there is increasing understanding that joint action for multi-stakeholder partnerships between private and public actors is essential for fostering building disaster and climate resilience. However, respective and collective roles and responsibilities to build this resilience are blurry and subject to negotiation – in Austria and elsewhere. Among the challenges in this area: many disaster risks affect private as well as public goods; legislation and policy have evolved over the years towards a partly explicit, partly implicit understanding of various actors' roles in preventing, financing, responding to, or recovering from risks and events linked to natural hazards; and actions undertaken by one actor may limit or broaden the room to manoeuvre of other actors, or the actions expected from other actors, and may encourage inaction or free-riding behaviour. These roles are being discussed and re-negotiated continuously, e.g., the role of insurance entities in a changing climate is a topic of constant and contested debate in Austria and other EU countries.

Further applied, policy-relevant research is needed to generate appropriate methods and tools to address the complex mix of competencies and responsibilities that are needed to develop more effective climate adaptation and disaster risk management. Policy-relevant guidance as well as operational input would help advance the development of an integrated Austrian strategy on adaptation. As a recent review has shown, coordinated and cross-sectorial initiatives across administrative levels are rare and are hampered by institutional barriers and a lack of clear allocation of responsibilities. Attention to local levels is of utmost importance.

The local risks and disaster risk management and adaptation tools discussed in the session may serve as a starting point for defining and advancing broad-based risk allocation. The "Local Reasons for Concern" tool, a scenario-based, pro-active risk management approach jointly developed with key stakeholders in the City of Lienz, holds promise, particularly if it can be integrated with forensic frameworks and broad resilience measurements to identify capacities and gaps. The approach and resulting guidelines of the LRC tool have since been vetted by the Städtebund. They may contribute to building long-term resilience at the local level by helping local decision-makers identify key climate and other risks and plan effective, efficient, and locally relevant adaptation and risk management measures. Further research should build on these insights and apply the lessons learnt to other cases and issues.

Communicating Risk

Risk Communication—Ways to Understand Each Other

Chairs

Thomas Glade, (University of Vienna)

Monika Stickler, (Austrian Red Cross, Vienna)

Background/ Introduction

Risk communication is a central aspect of risk management and governance. It defines the way information is collected, disseminated, perceived and understood by actors ranging from experts and responsible administrative units to the directly affected public and the general public. The aim of this session was to represent different backgrounds, concepts, and applications of risk communication used in a variety of Austrian institutional settings.

Key Challenges/ Questions

There are many challenges in finding optimal ways to communicate with and understand each other. Research and science collect a huge amount of data, but how is this knowledge most effectively disseminated? Authorities and organizations involved in risk assessment or risk reduction are experienced in dealing with various external conditions, but risk communication is not their primary focus. The general public – whether or not it has been affected by disasters previously – often has little access to information or is not very interested in engaging with risk assessment or risk reduction authorities. How do practitioners address all of these challenges, while meeting the main challenge of ensuring that the correct message reaches the targeted group in a timely manner?

Summary of Presentations

PD Dr. Florian Rudolf-Miklau (Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMFLUW))

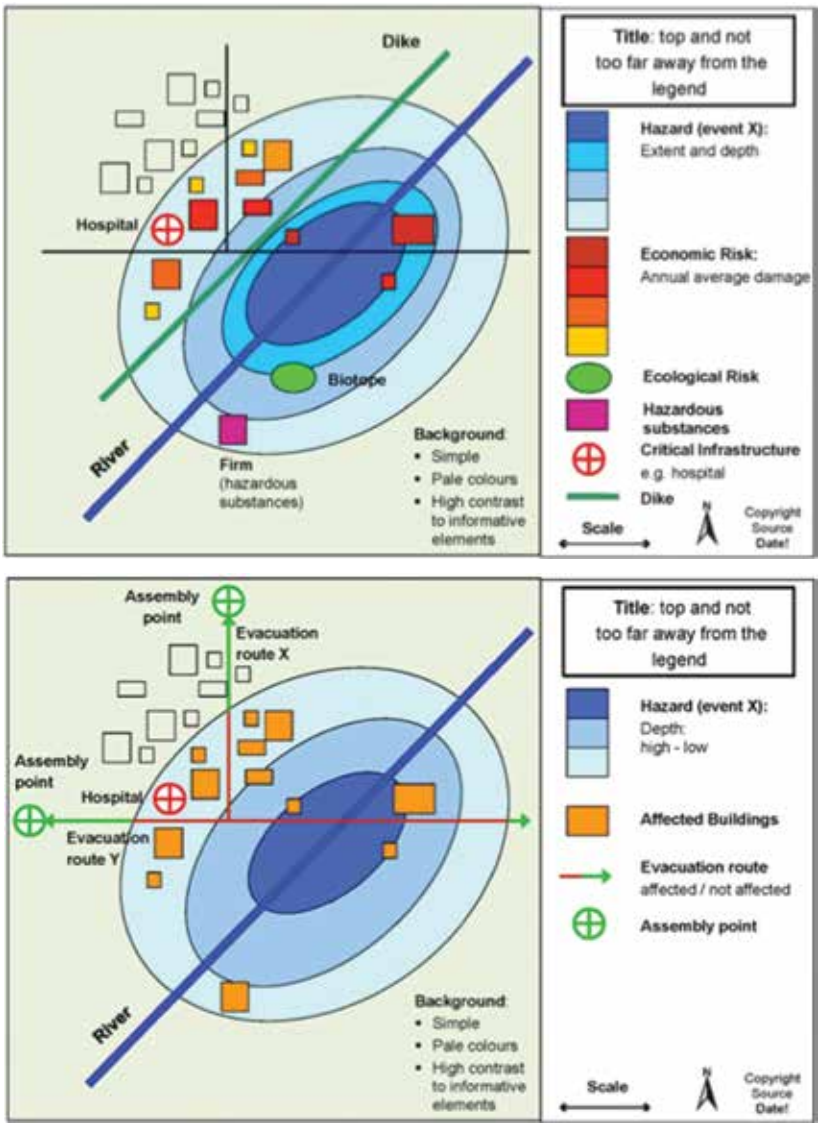
Dr. Rudolf-Miklau introduced concepts, strategies and experiences of risk communication within Disaster Risk Reduction (DRR) at municipality and regional levels. The governmental dimension of risk communication was addressed in discussion about the responsibility of the state to protect its citizens as well as the responsibility to inform the public about life-threatening emergencies and foreseeable disasters. In terms of the socio-political dimension of risk communication, it was noted that addressing "risk culture" is of major importance in any communication of risks. Risk was introduced as a construct based on many societal factors such as public opinion, socioeconomic position, or general moral concepts. Finally, within the operational dimension of risk communication, it is fundamental to ensure feasibility of risk

Photo credit: Nastco

participation of all involved parties within the risk management cycle.

Mag. Gerald Czech (Austrian Red Cross) – "Risk Communication or Communication as Risk?"

Starting with a brief introduction of risk resilience, the risk communication concept was linked to emergent social characters, to risk and coping strategies, and to the question of participation instead of education. The risk society was elaborated by explaining that risk is constructed, that one has to face ideological problems, and that there is a discrepancy between experts and their opinions and the trust of the actors involved herein. It was concluded that the communication of resilience is seen as a challenge for the future; an integrated approach combining risk and crisis communication is needed which must be implemented in both vertical and horizontal dimensions of society and which must utilize various types of social media in order to reach its goal.



From Fuchs S. et al. (2009): Evaluating cartographic design in flood risk mapping. Environmental Hazards 8, p. 52-70

PD Dr. Sven Fuchs (University of Natural Resources and Life Sciences (BOKU), Austria)

Dr. Fuchs discussed the challenges in communicating the spatial dimension of hazard and risk information, focusing in particular on related issues of probabilities, return periods, and uncertainties of events. At the outset, it was noted that affected residents, fore example, need different information than politicians. Nevertheless, probabilities are very difficult to communicate, whereas as research shows, the concept of "design event" is easier to understand. The 'design event' concept has already been incorporated into the Austrian spatial planning concept, specifically, Austrian Avalanche Control hazard maps. One of the draw-backs of such maps is that security is implied outside the delineated hazard zones, which is a crucially false conclusion. Within such maps, it is essential to present single objects of major importance with high contrast and to distinguish hazard information using spatial representations. In addition, information has to be merged and actions have to be described with clarity and in an accessible manner.

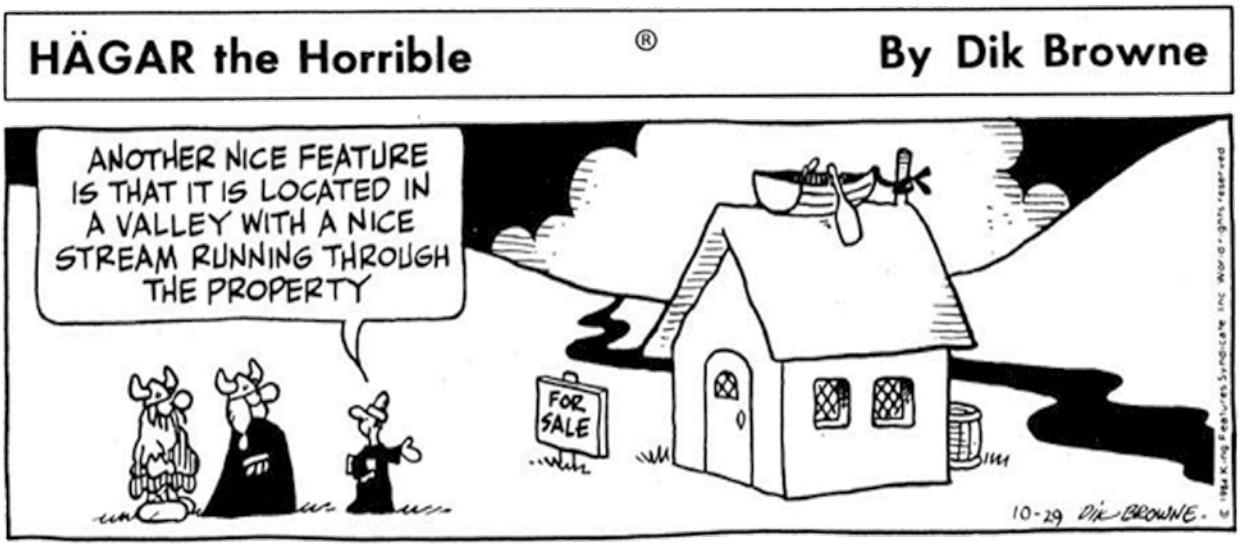
Mag. Stefan Schoenhacker (Ministry of the Interior (BMI), Austria)

The final presentation covered general concepts of education

for risk reduction, including principles of communication, as well as educational programmes targeted at different groups of interested parties. In Austria's primary and secondary schools, risk reduction and management including risk communication is not a formal part of the curriculum. However, risk reduction and management has links to the disciplines of Physics (radioactive threats), Biology (pandemics), Chemistry (toxic materials), and Geography and Economy (natural hazards and insurance, respectively), among others. In addition, many operational units such as the fire brigade, the Red Cross, Mountain Rescue, and others visit primary and secondary schools for special events to demonstrate their work and highlight their different missions. There is no general programme of study on risk communication available at the university level, although a few highly-specialized Master's programmes exist. At the University of Vienna, a general post-graduate programme targeted at employees of institutions that have to cope with emergency and risk situations has developed a Master's degree course on the topic "OeRISK – Risk Prevention and Disaster Management." However, the most prominent training on the general theme of "Risk Communication," which itself is often embedded within courses on Risk Management, are commonly offered as specialised advanced training courses by institutions such as the Ministry of the Interior, the Red Cross, the Fire Brigades, etc. with a certificate for completion.

Conclusions

This session highlighted the wide variety of activities and approaches used to address "risk communication." Risk communication is used in a variety of settings within risk management and governance depending on the parties involved, the specific purpose of the communication, and the type and variety of media available. Risk communication plays a central role in all kinds of contexts, and therefore needs to be utilized in order to increase the success of any risk reduction initiative. It is important to bring research, science, and education together with authorities and organizations involved in risk reduction in order to produce "risk communication" that is tailored to different target groups.



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http://www.coolgeography.co.uk/GCSE/Year11/Managing%20Hazards/What%20are%20hazards/natural_hazards.htm

Risk Governance

Chair

Mag. Robert Stocker, MBA - Head of Department for Crisis and Disaster Management, Ministry of the Interior Austria

Contributors

Priv. Doz. Dipl.-Ing. Dr. Franz Sinabell - Austrian Institute of Economic Research

Ass. Prof. Dipl.-Ing. Dr. Doris Damyanovic - Deputy Head of the Institute of Landscape Planning (ILAP), University of Natural Resources and Life Sciences in Vienna

Background/ Introduction:

Europe as a whole is considered to be significantly more developed in the field of crisis and disaster preparedness than many other regions in the world. However, within Europe and specifically within the area of the European Union, there are variations in approaches and quality in disaster risk management among the states. At the outset, it should be emphasized that European countries vary strongly in their risk profiles with respect to natural as well as technological hazards. In addition, as with other regions of the world, incidents in one country often have impacts on neighboring countries as well. Consequently, the international community strives toward common and harmonized solutions for disaster prevention and preparedness, risk monitoring, and public warning, including alarm tools.

Given its location in the heart of Europe, Austria not only faces hazards on its own territory, but hazards in its border areas with neighboring states. Additionally, given the economic importance of its tourist industry and its concern for the safety and security of its guests, Austria is eager to maintain the highest possible level of prevention and preparedness against disasters. Moreover, Austria´s rescue organizations as well as its fire services - both fundamental elements of disaster response - are built with and greatly dependent on volunteer services; indeed, about 50% of the Austrian population engages in voluntary activities. Against this backdrop, the role and responsibility of the state for the wellbeing of society is evident.

Key Challenges/ Questions

A key challenge in the field of disaster risk management lies in connecting public stakeholders and their activities with:

- disaster- and risk-related activities of the private sector
- needs identified for the safety and security of critical infrastructure
- opportunities resulting from progress in science and research
- new knowledge gained from lessons learnt from past disasters

In recent years, Austria has also worked on its national risk analysis. Having achieved first results from this analysis, it is crucial to adjust disaster management activities to reflect these results.

Photo credit: Dmitrij Paskevic

Austria is highly exposed to flood risks. In June 2013, major flooding in parts of Austria led to damages of approximately 0.9bn €.
(Photo creditoto: erwo1)

Summary of Presentations

Franz Sinabell from the Austrian Institute of Economic Research highlighted the economic dimension of damages resulting from natural disasters in Austria as well as the public expenditures for prevention. He also suggested possible ways to optimize damage control.

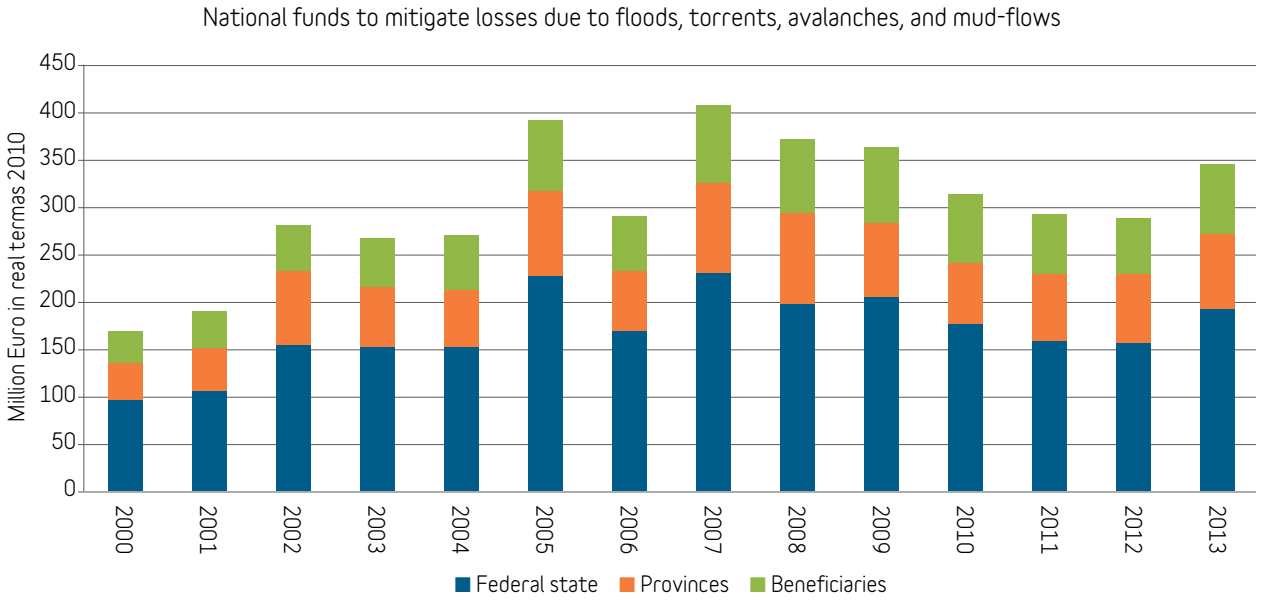
In addition to calculating the costs of immediate, tangible damage, the costs of economic consequences, welfare losses, and the temporary procurement of public goods need to be accounted for as well. In this regard, risk management not only consists of the management of the event itself, but also management of preparedness measures as well as management of potentially long-lasting recovery measures until life returns "back to normal."

In addition, relevant cost-benefit calculations need to be oriented towards the future. Here especially, spatial structure plans are often in conflict with risk mitigation strategies.

Prosperity, population growth, and the rise in the number of densely-populated urban areas increase expectations for losses in disasters. Countermeasures might include a damage control approach that integrates prevention strategies, the early involvement of mpeople living in areas at risk, and the balancing of regional funding programs with tax loads.

Prof. Doris Damyanovic from the University of Natural Resources and Life Sciences in Vienna emphasized that a target group-specific approach to the management of risks at the local level is crucial because disasters affect different groups of people in different ways.

Prof. Damyanovic's presentation featured key insights from the results of a target group-specific analysis regarding the various fields of action in natural hazards management. She also discussed tools and planning instruments developed for use at local and regional planning levels. The target group-specific analysis, examining aspects both during and after a natural event, highlighted the different ways disaster responses must address women and men and the young and old. The analysis found that response organizations as well as the broader public have sometimes neglected gender and group-specific aspects in



Source: Own estimates based on BMLFUW, 2015 and bmvit, 2015

addressing hazards. Furthermore, sound knowledge of target groups and differentiated approaches are necessary in order to properly consider the different needs of target groups.

Conclusion

Both topics that were presented and discussed are more relevant than ever, and in the light of the new "Sendai Framework for Disaster Risk Reduction," will require far more attention in the future.

In the discussion following the presentations, three key points emerged:

- lower population densities minimize hazard risks
- increased requirements in the context of risk governance lead to an increase in infrastructure costs
- even global and common challenges in terms of resilience require approaches at the local level

In our modern and connected world, the responsible actors (i.e., public authorities and, under their guidance, also public utilities considered to be critical infrastructure) require active communication channels and tools for warning the public of hazards. This is important not only for civil protection in the event of national hazards, but even more so with respect to local and regional hazard situations, which require immediate warning and information for citizens.

In Germany, one example of such an approach is the warning and alarm platform KATWARN, which was developed by the Fraunhofer organization together with German municipalities and public insurance companies and which has been in service for several years now.

KATWARN

On both the national scale and the local scale, the use of a modern communication tool like KATWARN allows the dissemination of warnings and information to the population via various information channels – e.g., SMS, social media, email, electronic advertising boards, electronic traffic information displays, TV, radio, sirens, QR codes – in cooperation with critical infrastructure operators. The public's reaction to such warnings and information is key to helping minimize loss of life, injury, and private and public economic damages.

Options for the Future: Satellite Earth Observation and Economic Evaluation of Climate Change Impacts

Chairs

Karl W. Steininger, University of Graz

Thomas Geist, FFG

Background/ Introduction

Satellite Earth observation and economic evaluation of climate change impacts are two individual fields of work sharing a common characteristic - they promise a bundle of new "options for the future" for risk analysis, mitigation, and adaptation.

In the area of satellite-based Earth observation, the European Earth Observation Programme *Copernicus* will catalyze many activities in the next years. The objective of *Copernicus* is to provide timely and reliable observation data and value-added information and forecasting on a wide set of geo-referenced parameters. The *Copernicus* service component combines observations from satellites and in-situ infrastructure (such as ground, air, ship, or buoy-based sensors), as well as reference and ancillary data, and assimilates them into a wide set of models.

To respond to the user demands, the *Copernicus* Service Component is organized into six thematic services, namely, the Atmosphere Monitoring Service, Marine Environment Monitoring Service, Land Monitoring Service, Climate Change Service, Emergency Management Service, and Security Service. These *Copernicus* services support a wide range of downstream applications in various

public and commercial domains, including in the field of risk analysis and mitigation.

Beyond climate change, there are very few areas where the lag between action and potential impact is as long and where the risk of delaying an appropriate response may entail impacts of such enormous magnitude. Thus, there is a clear need for adequate information for society on climate change and its impacts. Detailed information on the economic evaluation of climate change implications is crucial as a prerequisite for political decision-making about climate change adaptation and mitigation.

Key Challenges/ Questions

Climate change impacts are multi-faceted, interdependent, and characterised by a high degree of uncertainty. Thus, analysis of these impacts necessitates collaboration across a broad set of disciplines and expertise, and entails devising appropriate scenarios. Climate scenario analysis to date indicates that the expected mean values associated with climate change damage are increasing. However, since mean values by definition are surrounded by a considerable amount of uncertainty, it is crucial to consider the potential range of impacts that might occur.

Summary of Presentations

Alexander Almer (Joanneum Research) – "Satellite- and Airborne-based Remote Sensing Solutions for Emergency Management Support"

Climate change will lead to a dramatic increase in damage from forest fire and flooding events through the end of the 21st Century. Therefore, the optimisation of civil protection management is a crucial topic on national and international levels to protect human life and resources in a more effective way and to keep the impact of catastrophic events as low as possible. Key is the early recognition of crisis situations on the one hand and the targeted support of emergency response situations on the other hand. Multi-sensor satellite data and aerial imagery provide timely and comprehensive information products for decision-support before, during, and after catastrophic events.

In the European Earth Observation Programme *Copernicus*, specific services for emergency management will be established. Together with a flexible, airborne sensor platform, targeted support for emergency management activities can be realised.

Wolfgang Wagner (TU Wien) – "How is Global Change Linked to Local Actions? The Role of Earth Observation in Tackling Extreme Weather Events"

Until the middle of the 20th Century, most people could not imagine that human activities on the local scale would have an impact on the global environment. Even today, when the results of climate warming are obvious in many places, it is still hard for many people to recognize these changes as such and understand the implications of their activities for the global environment. Earth observation with satellites represents the best possibility to analyse these connections and make them more recognizable.

The presentation draws on meaningful examples to illustrate how a new generation of earth observation satellites could be used to capture the impacts and the damage caused by extreme weather events. It also shows how this satellite information can be provided to individual stakeholders for mitigation measures.

Karl W. Steininger (University of Graz) – Economic Evaluation of Climate Change Damages

The optimisation of civil protection management is a crucial topic on national and international levels to protect human life and resources in a more effective way and to keep the impact of catastrophic events as low as possible.

for Austria: Consistent Interdisciplinary Modelling and Results

Climate change causes manifold impacts at national and local levels, which in turn have various economy-wide implications (e.g., on welfare, employment, or tax revenues). Society needs to prioritize which of these impacts to address in its response, and what share of resources to spend on each respective adaptation. A prerequisite to deciding these priorities is an economic impact analysis that is consistent across sectors and acknowledges inter-sectoral and economy-wide feedback effects.

Traditional Integrated Assessment Models (IAMs) are usually employed for data at a level too aggregated for this end, while bottom-up impact models most often are not fully comprehensive, focusing on only a subset of climate-sensitive sectors and/or a subset of climate change impact chains. Thus, an approach was presented here which utilized climate and socioeconomic scenario analysis, harmonized economic costing, and sector-explicit bandwidth analysis in a coupled framework of eleven (bio) physical impact assessment models and a uniform multi-sectoral, computable general equilibrium model.

Heimo Berghold (ASFINAG) – "Evaluation of Natural Disaster Damage Protection by ASFINAG"

The ASFINAG road network is well protected against the effect of natural hazards. Impacts of climate change on the operation of the motorways could not be detected clearly even now. To be prepared for possible future challenges, the ASFINAG network will be checked during the coming years. In this inspection, all known natural hazard spots will be examined as to whether the present protection is sufficient. In addition, new danger zones will be investigated, while protective buildings will also be registered and rated.

This evaluation will not delve into detail; rather, the danger potential will be estimated by a specialist. All hazard points and protective buildings will be shown in a Natural Hazard Indication Plan and recorded in a database. Hazard points from the Natural Hazard Indication Plan that are expected to have a high danger potential will be investigated in detail. If action is warranted based on the detailed investigation, planning and building of protective buildings will be undertaken.

Conclusions

Both satellite earth observation and economic evaluation of climate change impacts promise a bundle of new "options for the future" for risk analysis, mitigation, and adaptation.

For satellite earth observation, their potential has to be proven through meaningful demonstration projects with close involvement of relevant user groups. The role of these groups is important to learning how the steady and growing data and information streams, for example, from the *Copernicus* programme, can be utilized in the most effective way.

In applying the economic evaluation of climate impact approach to the alpine country of Austria, we find that macroeconomic feedbacks can magnify sectoral climate damages up to fourfold, or that by mid-century the costs of climate change will clearly outweigh benefits—with net costs rising two- to fourfold above current damage cost levels. The resulting specific impact information—differentiated by climate and economic drivers—can support sector-specific adaptation as well as adaptive capacity building.

Disaster Risk Management and Adaptation to Climate Change

Chairs

Klaus Radunsky (Federal Environment Agency)

Birgit Bednar-Friedl (University of Graz)

Background/ Introduction

Time and again, Austria has been affected by natural disasters. Flood disasters have caused particularly extensive damage amounting to billions of Euros and involving human casualties as recently as 2002 and 2013. Heat wave disasters caused significantly lower damages, but more fatalities in 2003 and 2015.

The Special Report on Extreme Events and Disasters (2011) by the Intergovernmental Panel on Climate Change (IPCC) outlined, inter alia, that the climate change has already led to changes in intensity, duration, frequency or spatial expansion in extreme events, and that additional increases in intensity of these events – such as heat waves and torrential rains – are to be expected in the future.

A prediction-based approach for adjustment measures to tackle climate change aims to prevent extreme weather events from turning into natural disasters. This approach has the potential for success inasmuch as climate change can be limited by preventing greenhouse gas emissions. The increasing damage from disasters in Austria should be motivation to increase efforts towards raising resilience in facing extreme events.

Key Challenges/ Questions

The following four presentations focused on current examples of flood protection from the Netherlands and Austria, respectively, as well as on adjustment measures in the public domain and, concretely, in Styria. The following questions or topics were addressed, inter alia, in the lectures:

- Handling uncertainties
- Level of preparedness for

Photo credit: Paul Gilmore

structural protective measures, insurance, and emergency measures among private households

- Challenges concerning adjustments in the public domain
- Development of an adjustment strategy in a federal state: process, first results, and next steps

Summary of Presentations

Koos Wieriks (Ministry of Infrastructure and Environment, The Netherlands) – "Dealing with Uncertainties: The Dutch Approach"

There is a vital need for a preventive approach – as opposed to mere alleviation of damages – that involves increased resilience and a higher level of preparedness. This requires a strategic approach oriented for the long-term, which takes into consideration changing climatic conditions. For this approach, the planning horizon in the Netherlands is 100 years. The approach should be embedded in a broader agenda of sustainability (e.g., Sustainable Development Goals; specifically Goal 11) and in the Sendai Frameworks, both of which are based on a timeframe to 2030. The author suggested that the objectives of the Sendai Frameworks should also be applied at the level of cities and that all relevant societal groups should be engaged achieving the goals so as to install, inter alia, a monitoring and review process at the national public level. Such a preventive approach should be seen as a precondition of socially and economically sustainable development. In the Netherlands, the planning of measures (with citizen participation) takes place based on a risk management approach that includes the following three stages: prevention (stage 1), spatial planning (stage 2), ad contingency planning and crisis management (stage 3). Uncertainties must not serve as an excuse for inactivity; rather, they should be addressed by building increased flexibility into the planning and implementation stages. Finally, the "Build Back Better (BBB)" objective, inter alia, is instructive and should be emphasized.

Sebastian Seebauer (Wegener Center, University of Graz) – "Specific (National) Measures Against Floods"

This session focused on the first results of the project PATCHES – Private Adaptation to Climate Change – related to private flood protection measures. The process entailed surveying more than 1800 households in 10 Austrian communities, which were selected based on their experience with highly damaging flood disasters over the last 10 years. As part of the study, attempts are being made to promote the political and regulatory environment related to private adjustment, barriers, and incentives, as well as the information environment (Fig. 1). The session covered the packages of measures – inter alia, structural measures, special insurances, and emergency measures (sandbags) – already being used by the affected households. A major finding of the evaluation is that insurances are being implemented as a stand-alone measure, whereas consultation with neighbors, emergency measures, and the elaboration of an emergency plan are being implemented in a combined fashion. Notably, an additional group of households opted for no form of protective measures, relying on the principle of hope.

Birgit-Bednar Friedl (Wegener Center, University of Graz) – "Adjustment in the Public Domain"

The project PACINAS – Public Adaptation to Climate Change incorporated, among other activities, a detailed breakdown of the 132 measures included in the Austrian Adjustment Strategy. It examines the relevant stakeholders and elaborates on the individual steps to be taken in the process of initiation, funding, implementation, and beneficiary identification, as well as in comparing the contribution of public and private stakeholders. Thus, it is possible to show that the private sector is also a frequent beneficiary of activities in the public domain, although initiation of those activities comes predominantly from the public domain (Fig. 2). The study has also shown that in the course of implementation of the national Adjustment Strategy many federal departments will be affected and that many fields of adjustment will affect several departments simultaneously. However, climate-induced expenditure directly impacts the budget in the form

Figure 1. Risk layering concerning private households dealing with floods

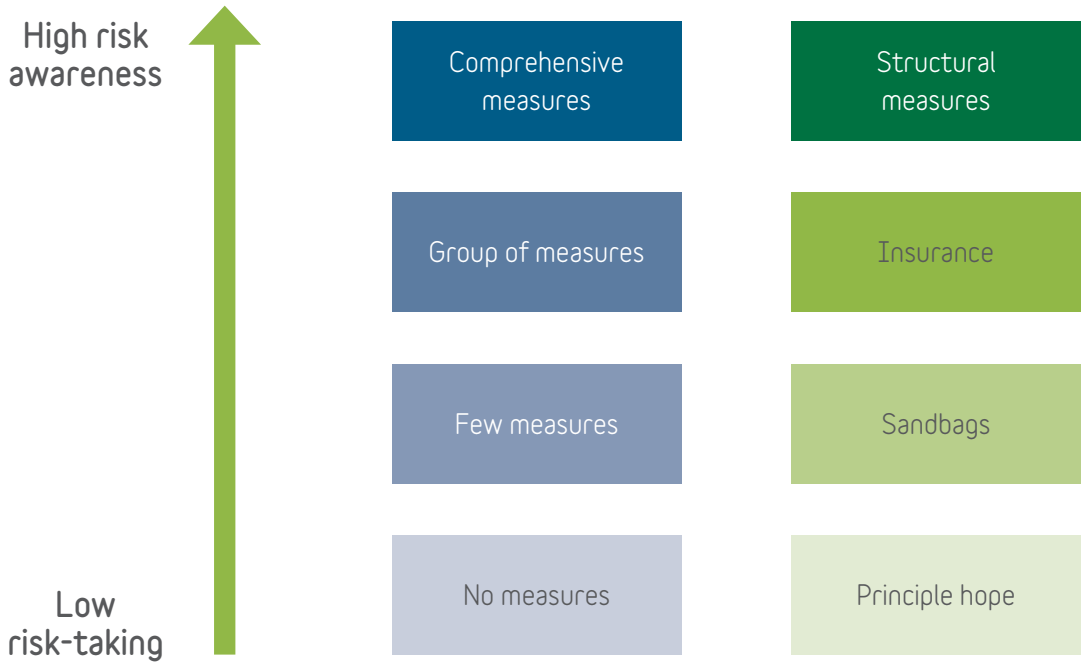
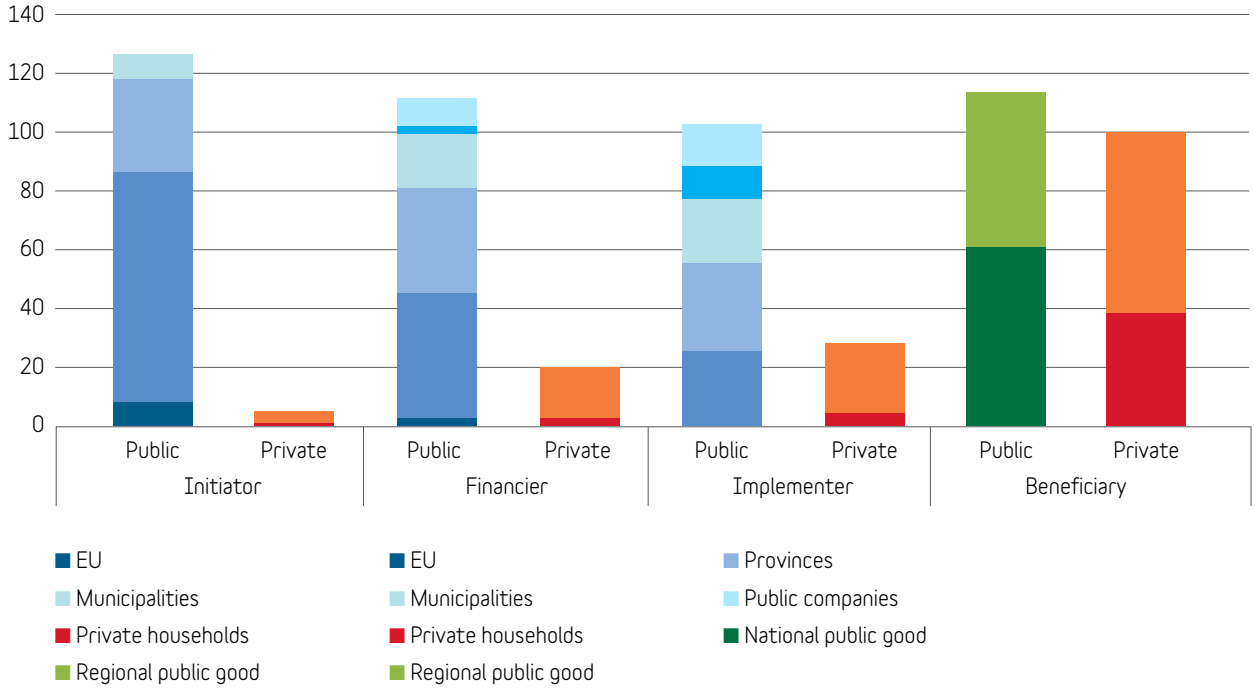


Figure 2 Classification of the Austrian Adjustment Strategy's measures by stakeholders and stages of implementation



of increased spending, but also indirectly impacts the budget by means of a reduced tax base, for instance, as a consequence of increased repairs of damage from flooding.

Therefore, effective implementation of the Adjustment Strategy requires close inter-departmental coordination. Furthermore, regular and consistent documentation of adjustment-related public expenditures is essential in order to enable forward planning in a process of iterative risk management.

Conclusions

The management of natural disasters in Austria is characterized by response-recovery governance. With respect to adjustment to climate change in Austria, a first step of the awareness-raising process is underway among several sectors, municipalities, and federal states.

However, a comprehensive, inter-related approach based on iterative risk management is lacking. Such an approach is necessary for the development of a strategically-oriented plan to cope with the increasing climate risks expected over the coming decades.

Climate-induced expenditure directly impacts the budget in the form of increased spending, but also indirectly impacts the budget by means of a reduced tax base, for instance, as a consequence of increased repairs of damage from flooding.

Andrea Gössinger-Wieser (Climate Protection Coordinator, Federal Land of Styria) – "Styrian Adjustment Strategy 2050"

The climate change adjustment strategy of Styria was passed in October 2015. It contains 97 measures pertaining to settlement area; agriculture, forestry, and ecosystems; the economy; and health, social welfare, and education, as well as security of supply. Operational coordination of the strategy was carried out by the climate protection coordinator supported by a core team consisting of representatives of different local departments, as well as an extended project team that also included external experts (from the Federal Environment Agency, inter alia). The objective of the measures is to lessen, i.e., prevent the undesirable consequences of climate change for natural, social, and economic systems. Each measure included the following actions:

- Defining relevant stakeholders and involving them in the process
- Carrying out an inventory of existing adjustment measures
- Defining gaps in scientific bases for adjustment measures
- Identifying affected areas
- Determining adjustment measures missing for the respective areas
- Performing an expertise- and time span-related prioritization of the measures
- Identifying responsibilities
- Defining implementation of the measures for the period between 2016 and 2020

Among other objectives, the approach would have the task of demonstrating how the objectives of the Sendai Framework can be realized at all administrative levels by means of preventive adjustment measures through 2030 and beyond.

In order to improve private risk protection, it is essential to customize information for different types of private households.

The example of the Netherlands could provide valuable lessons for coping with the aforementioned challenges.

Regular and consistent documentation of adjustment-related public expenditures is essential in order to enable forward planning in a process of iterative risk management.

Necessity is the Mother of Invention— Innovations in Flood Risk Management

Chair

Mag. Cornelia Jöbstl (riocom – Engineering Office for Environmental Engineering and Water Management)

Presentations

DI Hans Wiesenegger (State of Salzburg, Hydrographic Service) – "Learning from Damage – Lessons Learned as Foundation for New Avenues in Flood Risk Management"

DI Albert Schwingshandl (riocom – Engineering Office for Environmental Engineering and Water Management) – "Innovative Software for Flood Modeling and Visualization"

DI Gerald Loew (City of Vienna, Department Vienna Water Management (MA45)) and **Mag. Dr. Philip Leopold** (Austrian Institute of Technology GmbH) – "Viennese Danube Flood Protection and Dam Monitoring by means of GPR"

Deputy Chief Fire Officer Ing. Heimo Krajnz (City of Graz, Department of Disaster Protection and Fire Brigade) – "Innovation in Flood Risk Management from the Perspective of the Fire Department, Towards Integrated Disaster Management"

Statements

Mag. Dr. Sebastian Seebauer (Wegener Center for Climate and Global Change, University of Graz)

Thomas Ramminger (Münchener Rückversicherungs AG (Munich Reinsurance Company))

Thomas Hartinger, MSc (Rosenbauer International AG)

Conceptualization of the Session

DI Ines Fordinal, Mag. Cornelia Jöbstl, and DI Clemens Liehr

Background/ Introduction: Austria: Flooding and Innovation

Based on its geographical location in the Alpine arc, Austria has always been characterized by natural hazards such as rockfall, avalanches, mudslides, and flooding. Flooding ranks highest among natural hazards in terms of damage potential (e.g., damages amounted to €870 million in 2013[1]). Ingenuity is key to enabling people to develop strategies and tools to best handle constantly changing risks. A process of development from invention to innovation is necessary in order to achieve far-reaching changes. Changes occur primarily when something appears to be both meaningful and useful to the user and meets social acceptance. The current innovation process with regard to flood risk management – shifting away from pure constructional safety measures towards viewing the entire risk cycle – is one such example. This approach has already been reflected in the EU Floods Directive 2007/60/EG. Accordingly, innovation is required in all fields of the flood risk cycle (precaution, protection, awareness, preparation, and aftercare).

Key Challenges/ Questions

Despite the title of the session, innovations also occur outside

[1] Source: Federal Ministry of the Interior, www.bmi.gv.at

Figure 1: Salzburg – flood event 2012
Picture: State of Salzburg, Department of Water Management

of emergency situations. Chance or curiosity also plays a vital role. Innovations can also come about when something is re-thought, when something that already exists is improved, or when something old is modernized by using new technologies. Consequently, the session focused on answering four questions:

- Which innovations already exist and which ones are currently emerging?
- Which areas require more innovation (precaution, protection, awareness, preparation, aftercare)?
- Which kind of innovation is required?
- What is required in order for innovation to be implemented into practice?

Learning from the Past

Challenges and problems that arise in the course of flood events are never enjoyable in a crisis situation. However, they can prove to be beneficial and propel further developments in flood risk management. One possible tool for identifying the requirements to develop innovative approaches is an analysis of strengths and weaknesses. The Salzach River, in the federal state of Salzburg, has been the scene of two historic flooding events (2002 and 2013) in recent years. A strengths and weaknesses analysis was carried out concerning the 2013 event during an interdisciplinary workshop in cooperation with the Salzburg University. As a result, a variety of key factors were identified and lessons learned were produced for future prioritization:

- **Communication:** A clear communication structure and language comprehensible to all involved are necessary (e.g., emergency response organizations, media, general public)
- **Residual risk:** All possible and impossible scenarios should be taken into account

Figure 2: Donauinsel Vienna
Picture: MA 45 – Vienna Water Management

Figure 3: Dam monitoring with use of ground-penetrating radar
Picture: AIT

- **Praxis:** Flood practice exercises should be carried out regularly
- **Network:** Local networks comprised of all stakeholders should be established and maintained

Exemplary, Already-implemented Solutions

Innovative and bold projects that have already proven to be well-functioning solutions in practice can serve as examples to spur future developments. One example is the Donauinsel (Danube Island) in Vienna. The island (21.1 km in length but only up to 250 m in breadth) and the New Danube flood relief channel were constructed by the City of Vienna between 1972 and 1989. Today, the system provides flood protection for 600,000 inhabitants of Vienna. The combination of flood protection and leisure area, serving up to 15,000 daily visitors, represents a success story. Donauinsel has become an integral part of life for many Viennese. Thus, the project can serve as an example for similar solutions across Austria as well as worldwide.

Use of Latest Technologies

In addition to the Donauinsel, the Vienna flood protection system includes dams on the left and right bank along the Danube. Ensuring their proper function is a top priority. For this reason, the City of Vienna, the Austrian Institute of Technology, and the Central Institution for Meteorology and Geodynamics have developed a modern monitoring system employing ground-penetrating radar. With this system, it is possible to determine weak spots and alterations in the dams within a decimeter's accuracy and to take appropriate measures. The system has been operating successfully since 2014.

Forward-looking Developments

With regard to flooding simulations, it was hitherto necessary to use various software solutions for modeling, analysis, and visualization. This was a time-consuming process requiring specialist knowledge of each of the programs. In order to address this challenge, a new software entitled Visdom (http://visdom.at) is currently being developed in Austria by VRVis – Center for Virtual Reality and Visualization – in cooperation with the Vienna University of

Figure 4: Simulation and visualization of a flooding caused by overflowing of mobile safety barriers with the use of the Visdom software
Picture: VRVis

Figure 5: Disaster protection app for the citizens of Graz
Picture: Graz Fire Brigade

Technology (Institute of Hydraulic Engineering and Water Resources Management), riocom Engineering Office, and the Cologne City Drainage Operations. Visdom combines modeling, analysis, and visualization in one program. With this software, comprehensive data on vulnerability can be processed in risk analyses; the effectiveness of emergency procedures such as sand bags can be modeled in the form of a time lapse; and visualizations can be performed in 3D. This innovative software is currently available as a prototype and shows immense potential as a visual decision support system in the field of flood management.

Focus on the Human Being

Human behavior in exceptional situations is increasingly serving as the basis of planning and decision-making in new prevention and coping strategies. Emergency response organizations, too, have been increasingly urged to implement these new approaches as part of integrated disaster management. In the city of Graz, strong emphasis is put on information for and support of the population. To this end, new tools and measures were developed, such as an emergency signal, a disaster protection app, and publicly accessible sandbag depositories in case of an emergency. In addition, close cooperation with citizens' initiatives was established in order to incorporate special needs of the population into the process as early the planning stages.

Conclusion and View into the Future

Based on these examples of innovation in the field of flood risk management, Austria is on a good track: successes like Donauinsel have already been achieved and further exciting innovations like Visdom are currently in the development stages. However, given the challenges of climate change and changes in precipitation patterns, or the increased risk potential due to settlement development, much still needs to be done. In a constantly developing

society, the need for innovation will remain in any case.

Consequently, the question arises "What should be prioritized for the future?" Some initial ideas, suggestions, and trends can be found in the points made by the speakers, as well as from a real-time, online survey of the URAT audience of Austrian experts in the field of risk management.

A relatively clear picture has emerged in the process: while innovation is often associated with technological progress, in this case the necessity for innovation in the social sphere is evident. Conference participants have indicated that future innovation emphasis should be placed primarily on the areas of awareness-raising and communication.

In addressing the question "What is necessary in order for innovations to be implemented in practice?" participants indicated: simplicity, courage, and communication, followed by information, knowledge, and training. These key points can serve as guidance as to what and how future measures should be taken in Austria. Listed below are all answers and results of the survey in detail.

Figure 6: Audience opinion – Which fields of the risk cycle require the most innovation?

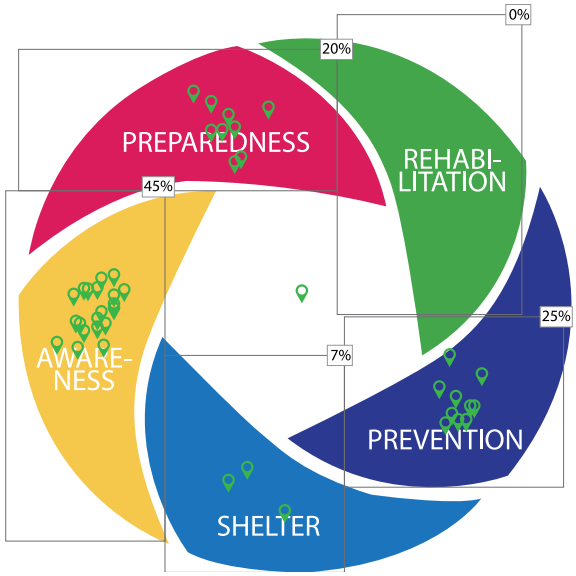


Figure 7: Audience opinion – If you had €1 million at your disposal, what form of innovation would you invest in?

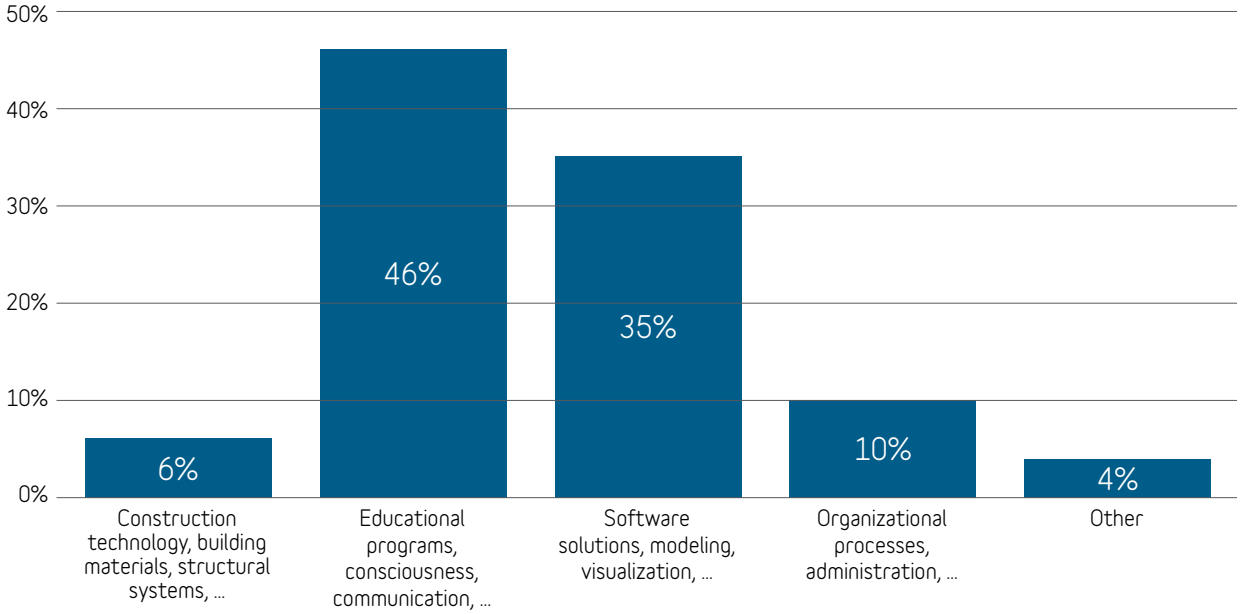


Figure 8: Audience opinion – What is necessary in order for innovations to be implemented in practice?

Table 1: Audience opinion summary – Innovations in flood risk management

Question	Answer
Which fields of the risk cycle (precaution, protection, awareness, preparation and aftercare) require the most innovation?	45% of the respondents stated "awareness"
If you had €1 million at your disposal, what form of innovation would you invest in?	46% of the respondents stated "educational, awareness-raising and communication measures"
What is necessary in order for innovations to be implemented in practice?	"Simplicity", "courage" and "communication" were the most cited words

Table 2: Speakers' answers to the question "What is your most important point?"

Speaking a common language, which is understood by all!
Staying in touch with the reality on the ground, looking at the users' needs while steadily and bravely heading in the direction of developed visions
Political standpoints differ from those of the professionals in the field of flood safety. It is imperative to keep this very fact in mind when discussing flood safety.
Operators and officials should have the courage to carry out innovations; there are many ideas, but little is implemented
There should not only be criticism concerning everything, we are all in the same boat (population, experts…)
No technical innovation without social innovation
A proper package of measures, cost-benefit factor, accurate communications, also reaching beyond the coverage of the major events

A relatively clear picture has emerged in the process: while innovation is often associated with technological progress, in this case the necessity for innovation in the social sphere is evident.

Risk Management through Insurance

Chairs

Thomas Hlatky, VVO

Franz Prettenthaler, Joanneum Research

Background/ Introduction

The session dealt with the task, function and role of the insurance industry, particularly in Austria, in connection with risk management. It examined risk management as a core competence of the insurance industry, highlighting the decade-long experience with handling risk. In addition, current developments in the field of risk communication, such as zoning instruments, or preliminary work on individual responsibility in the field of natural disasters were presented with the use of concrete examples. The insurance industry has a crucial role to play as a risk carrier, as well as a know-how provider for the Austrian society.

Key Challenges/ Questions

The greatest challenge in the area of risk management through insurance is the unwillingness of public authorities to provide support for the development of an ex-ante risk-transfer mechanism for natural hazards. Despite the existence of finalized proposals for a comprehensive insurance solution, no political will on this topic has developed.

Presentations

Thomas Hlatky (VVO) – "Public Private Partnership in the Insurance of Flood Risks: Options for Reforms and Lessons Learned"

Johannes Hübl (BOKU), Susanne Tscharner (Boku) – "'Understanding Risk' as Basis for protecting buildings"

"Risk communication is any purposeful exchange of information about risks between interested parties" (WHO 2001) is especially meaningful when it comes to the assessment of risks involved with building in areas endangered by natural hazards. The lack of standardized information about the risks, but also also about the resilience of a building and its site lead in many cases to asymmetric structures of information when a building is put on the market, or objects are used for a particular purpose with a higher degree of vulnerability or exposure. Suggested elements of consideration for natural hazards are floods, avalanches, rockfall, storm, earthquakes etc., parameters for the increase in safety is the material of choice (steel, concrete, brickwall, wood etc.) and measures taken which consider different scenarios depending on location, exposure and expected changes with climate change.

Hans Peter Hutter (Medical University of Wien) – Medical risks of climate change

From a medical standpoint it is obvious that society has to cope with a wide range of health effects/ threats affecting the population. In consequence, the Austrian public health system is challenged to prepare and implement climate change adaptation measures.

The answer to where and when we might see which effects on human health is complex. That is because most health outcomes are multicausal, various non-climate associated factors are also changing over time, and climate change affects local environments differently, according to characteristics of local geography.

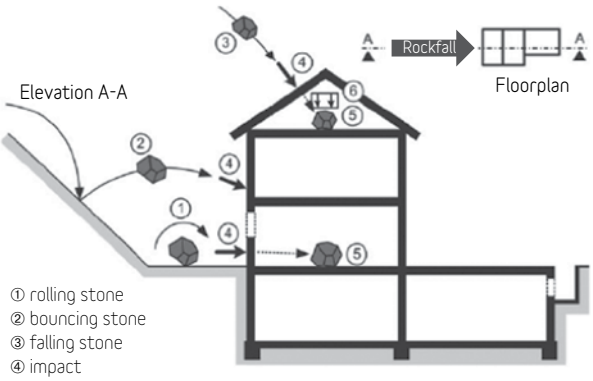
Photo credit: Joaquin Toro

- "Insurance" alone will not succeed in developing a sustainable NatCat system
- Many factors need to be addressed systematically, especially risk-based pricing and prevention measures, in order to keep premiums low over the long run
- The lack of risk awareness among the public at large has to be addressed by all stakeholders
- Government must restrict ex post subsidies if private insurance is in place
- Private Insurance is severely hampered if governments open up the "horn of plenty" in the event of NatCat events

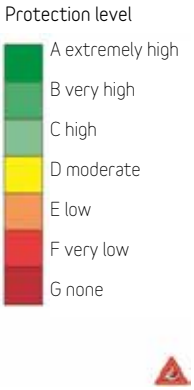
For Austria, direct health effects of climate change with a high prognostic certainty are seen as the most pressing topics for adaptation measures. These effects include the acute impact of extreme temperatures, especially heat waves in urban areas, and heavy rainfalls with flooding, mud flows and landslides. High precipitation events can have long-term effects like posttraumatic stress syndromes, damage to infrastructure and buildings with impact on health, and migration which also should be in the focus of public health planning.

As we see in several areas low awareness in the population (e.g., trend to use of air condition during heat waves instead of reasonable heat related behavior) significant more actions to rise awareness are needed.

There is no doubt that adaptation measures are necessary and reasonable. However, adaptation is no alternative to the reduction of greenhouse gases.



Source: Suda and Rudolf-Miklau



Franz Prettenthaler (Joanneum Research) – Flood Risk Pooling in Europe

Conclusions

Much positive development has taken place in Austria since the flooding of 2002.

However, many risk management targets are still to be reached. This applies, for example, to free access to risk management information and data or the building of a NatCat disaster compensation scheme together with the insurance sector – a major goal for the years to come in responding to a changing climate.

Climate change will affect medical and social risks in many ways; preparations have to be made in advance, starting with raising awareness. Climate change will become a huge challenge for our existing social welfare system that will be exacerbated by migration movements associated with climate change. Next steps are necessary on all points of the agenda for the Climate Change adaptation strategy with a special focus on prevention and individual risk management. Personal responsibility and prevention will become crucial for adaptation rather than a reliance on public services to provide post-disaster relief.

Participants

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