

## Session DD 9.2: Managing climate extremes in practice

<b>Chairs</b>	Prof.dr. Jeroen Aerts, VU University, the Netherlands and dr. Swennja Surminski, Association of British Insurers, United Kingdom
<b>Keynote speaker</b>	Dr. Thomas Loster, Munich Re, Germany
<b>Speakers</b>	Dr. Albert Klein Tank, KNMI, the Netherlands Prof. dr. Reimund Schwarze, UfZ Potsdam, Germany Prof. dr. Elizabeth English, University of Waterloo, Canada Philip Bubeck, VU University, the Netherlands Wouter Jonkhoff, TNO, the Netherlands Dr. Aris Marfai, University of Joghjakarta, Indonesia Jan-Moritz Müller, LSBG Hamburg, Germany Yu-tzu Lin, Architecture and building Research Institute, Taiwan Camille Manning-Broome, Centre of Planning Excellence, Baton Rouge, USA
<b>Rapporteur</b>	Dr. Monique Slegers, Knowledge for Climate, the Netherlands

Thomas Loster starts off in this session with a keynote speech about insurance arrangements for climate change and extreme events. In his presentation he discusses the insurability of climate change and extreme events. Events have to be sudden, unforeseeable and calculable. He compares arrangements in the 'insured world' or sometimes, such as in USA and European countries, and in the 'uninsured world', mostly the poor countries. In the insured world private companies have highly sophisticated tools to assess the risks of extreme events of a certain area. When risks and potential losses are too high the companies or households cannot get insured. In the poor world hardly any insurance is available even though these areas are also prone to risks and extremes. A few examples of small scale initiatives in the uninsured world show how on a small scale good and simple arrangements can be made. New initiatives are on the way to try to secure extreme events.

The second presentation in this session focuses on the monitoring of European changes in extreme weather and climate events. Because of climate change it is likely that there will be changes in extremes that are beyond the normal variability. At the moment global datasets are used to assess extreme events such as Moskou's heat wave in 2010. Albert Klein Tank argues the need for more robust data and of a high resolution. He presents two projects that monitor climate extremes on a European scale.

Several presentations in this session focus on flood risk and damage. Philip Bubeck explains about the development of a flood risk model to get a better insight into the current and future flood risk. Climate change and socio-economic development are taken into account as important drivers. The model is also a tool for assessing the effectiveness of adaptation strategies. Outcomes show that the increase of flood risk in the Rhine-Basin ranges between 53 and 230% (2000-2030). Probabilities of extremes and the impact of climate change are very uncertain. Damage reduction seems to be a robust adaptation measure.

For the assessment of flood damage it is important not only to look at the direct damage of economic objects, but also to look at a wider spatial and time frame. Wouter Jonkhoff studied the regional economic effects of floods in the Rotterdam area. His study estimates that the total damage increases with 15-55% when taking into account the region outside the flooded area and the long-term effects. Inclusion of long-term effects in flood risk assessment can contribute to improved water safety policy, spatial planning and insurance.

Aris Marfai introduces us to an ongoing study in the coastal area of Jakarta, an area that is regularly flooded. Urgent adaptation measures are required to address the flood problem in this area. The high rate of subsidence also has to be taken into account. The Jakarta city government is working on a plan for flood risk management. In a study current and future flood risk will be assessed. This study also looks into the governance structure to assess the potentials and the bottlenecks for integrated flood risk management.

Yu-Tzu Lin shows us the importance of a good disaster management system for Taiwan. More than three third of the Taiwanese population live concentrated in an area exposed to natural hazards, mostly earthquakes, landslides and typhoons. The country is highly vulnerable for the effects of climate change. She explains how the government of Taiwan has established a spatial planning system for urban disaster prevention. This spatial planning system integrates all hazards and uses a pro-active approach in which public participation plays an important role.

Jan-Moritz Müller gives a short overview of the present coastal protection strategies applied by cities along the North Sea coast and how these countries deal with future sea level rise. He found that the time frame considered differ between countries. The applied strategies include a variety of different technical measures. The future strategy of Hamburg will focus on technical flood protection.

Reimund Schwarze looks into how to economically motivate households to take precautionary measures against floods. This study was undertaken in two catchments in Germany after recent floods. The study shows that large investments are only economically efficient if a building is flooded regularly. Small investments are still profitable if a building is flooded only every 50 years. Financial incentives, such as conditional government aid, can motivate households to invest in precautionary measures. In this case the government compensates damage only when a household has taken 'reasonable' precautionary measures.

Elizabeth English explains the work of the Buoyant Foundation Project (BFP) to reduce people's vulnerability to extreme flooding. BFP was founded after hurricane Katrina. Its mission is to support the recovery of new Orleans' unique and endangered traditional cultures. Within the project homes are created that float in a flood, a so-called amphibious home. The concept of amphibious homes has also been applied elsewhere, also in the Netherlands. A prototype of a low-cost amphibious home has been constructed in 2009 in Dhaka, Bangladesh by an architecture student. Empty water bottles were used to construct the flotation blocks of this LIFT home (low income flood proof technology).

The final presentation in this session also focuses on the New Orleans area. After hurricane Katrina the possibilities for protection and restoration of the Louisiana coastline were studied. The Netherlands contributed to this study by identifying best practices in the Netherlands that are applicable in Louisiana. Camille Manning-Broome explains how with the help of the Netherlands a first a regional land use planning for Louisiana was developed in 2007. Louisiana has no office for state planning and had no land use planning so far. Following this a best practices manual is prepared with local, national and international experts to give the local governments, developers and coastal communities ideas for sustainable land use planning and to empower them to make wise decisions.