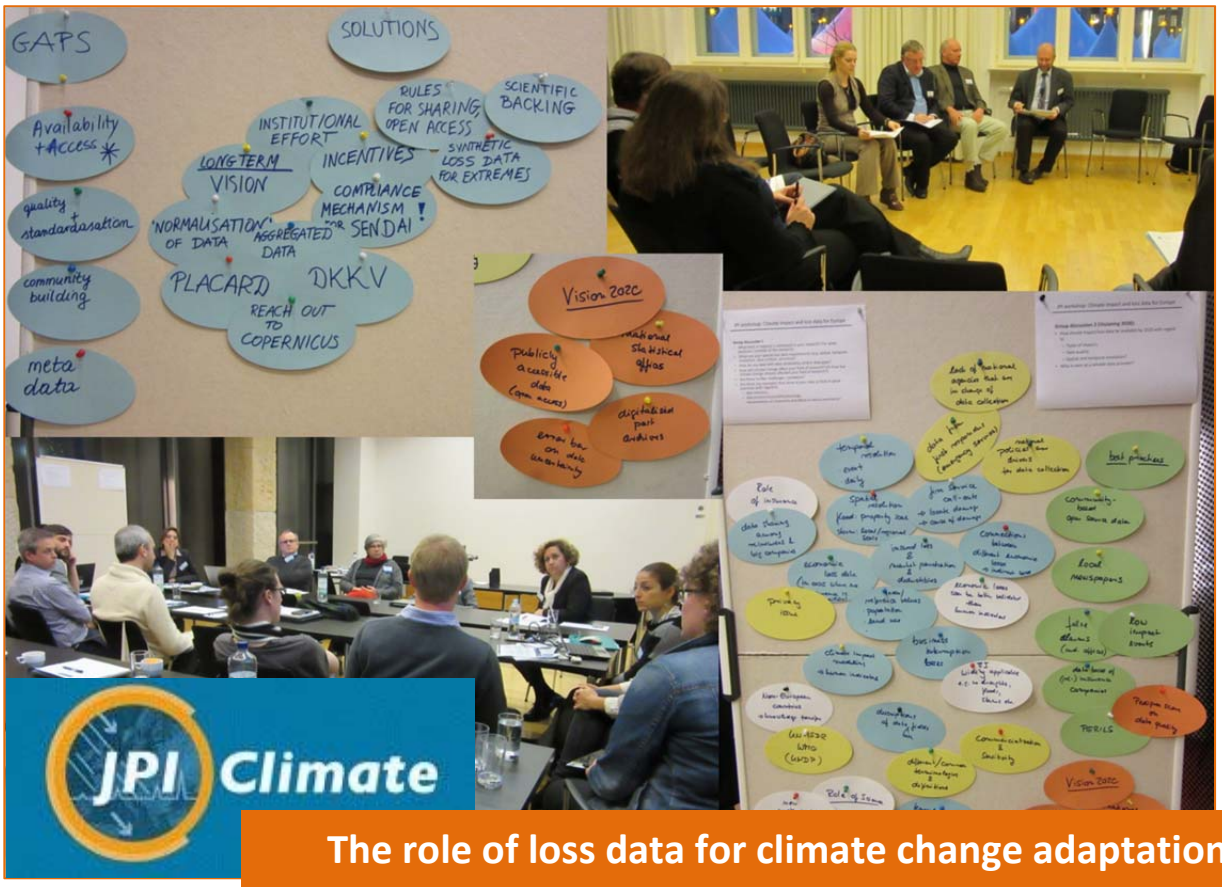

The role of loss data for climate change adaptation and disaster risk reduction in Europe

Policy recommendations

In December 2015, a two-day workshop was hosted by JPI Climate in Berlin, Germany, to discuss with representatives from academia, industry and public administration how to improve availability and quality of climate impact and loss data in Europe in order to meet the requirements of new international agreements.

In Europe, hydro-meteorological events such as storms, floods, and landslides have caused 64% of the reported damages due to natural hazards since 1980; climatological events, i.e. extreme temperatures, droughts and forest fires, account for another 20% according to the European Environment Agency. Data from Munich Re illustrate that overall losses from these weather-related events have increased from EUR 9 billion in the 1980s to more than EUR 13 billion in the 2000s (inflation-corrected), calling for better policies on disaster risk reduction. Given that climate change is likely affecting the frequency and intensity of such events, disaster risk reduction is an important part of climate change adaptation.

However, a lack of data on climate impacts and disaster losses limit our knowledge on and understanding of adaptation needs as well as efficient prevention and risk management measures. Additionally, it hinders the development and validation of reliable loss models, which are essential for risk analyses and efficient decision making. In comparison to other scientific fields related to the climate system, disaster loss data are still scarce, incomplete or inaccessible; methods on assessing losses and damage are in their infancies. Therefore, enhanced efforts to collect loss data and the development of transparent methodologies and the provision of standardized datasets have been constantly demanded – also in Europe. With newly agreed international agreements such as the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR), the Sustainable Development Goals (SDGs) and the Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC), this requirement is now becoming a pressing field of action if Europe wants to fulfil internationally agreed standards.

According to the SFDRR, countries have to be prepared for monitoring and continuously reporting on the progresses made in disaster risk reduction by 2020. Therefore, more than 30 representatives from academia, industry and public administration discussed on 16 and 17 December 2015, how to improve availability and quality of disaster loss data in Europe.

The vision: what data should be available by 2020?

Besides human indicators, i.e. the number of dead, missed, injured, evacuated, exposed and/or affected people, information on economic losses is of utmost importance. In 2020, such data are systematically collected and reported on a municipal or even finer spatial scale (e.g. at property scale) on different timescales, i.e. as a yearly sum, but also per event day, and for different economic sectors. Insured losses are distinguished from uninsured and are accompanied by information on the insurance market of the affected countries or regions (e.g. market penetration, average deductibles) to allow correct data interpretation and usage. The same holds for basic socio-economic data on exposed and total population, land use, income etc. in affected regions. Besides direct losses, information on business and transport interruption is frequently provided. Cascading effects e.g. along production chains are often investigated. Furthermore, expenditures on disaster risk reduction and emergency management and related information such as protection standards, extent of property-level measures etc. are recorded annually.

Data classifications and indicators are comparable across Europe and allow cross-country investigations. Transboundary events are documented and analysed not only per country, but also in transboundary projects considering the whole risk chain from the triggering event, the pathways down to the

consequences in all affected regions. Hence, damage indicators can be easily linked to hazard intensities at different scales. For particular purposes, such as the development of impact or loss models, representative samples of detailed data at the property/asset scale are regularly collected and provided covering a range of events, from frequent to extreme events. Data from past events (since 1950) has been digitized throughout Europe. A common methodology to index losses has been agreed on the basis of a scientific investigation and comparison of currently available methods. Information on data quality is generally provided by error bars or confidence intervals of the reported numbers and can be easily processed in climate impact models.

Data from research projects are archived and – if possible – regularly updated by dedicated national data centres as well as a European data centre funded by research funding organizations. Data is publicly available and a meta-search engine facilitates data accessibility. Data gaps are systematically closed by targeted and tailored data collection efforts.

Next steps: how to get there?

Without compliance mechanisms for the implementation of the SFDRR and without institutional efforts the vision described above can hardly be reached. Current commercialization of data provision should be reflected, too. Therefore, European member states should adjust their legislations and regulations so that the SFDRR as well as the European commitment to open-access data can be implemented and data collection and accessibility are facilitated. Past experience revealed that national policies can be strong drivers for disaster data collection. Synergies between different policy fields such as sustainable development, disaster risk reduction and climate change adaptation should be identified and considered with regard to progress monitoring and related data collection and reporting.

Next, institutions in charge of data collection, processing, quality control as well as data storage and provision have to be mandated. While science can contribute to the development of methods, standards and approaches, continuous and standardized loss data collection is the responsibility of public administrations. Particularly statistical offices are seen as reliable providers of high-quality and accessible data. By 2020, reporting procedures and related polices have to be put in place so that data collected on the local scale, e.g. by first responders such as fire brigades, the police or at health facilities, are regularly reported and aggregated up to the national (and European) scale. For this, clear definitions, standards and procedures have to be established. Besides rules for data sharing and open accessibility of publicly funded projects, incentives for data collection and sharing have to be developed. Therefore, innovative ways for science-policy interaction need to be created and more transdisciplinary approaches have to be tested and supported.

In order to meet (new) requirements of different data user groups, annual user meetings are organized by the statistical offices. Open research questions should be addressed by dedicated research projects.

To meet all user requirements a stepwise data collection should be established. Core information as requested by the SFDRR should be continuously recorded from the municipal to the European level. If certain hazard or impact thresholds are exceeded, efforts on data collection and forensic disaster analysis should be enhanced and aligned across all affected regions and countries. To better capture data variability, a certain number of low to medium impact events should be yearly analysed with the same level of detail.

Open research questions

A number of open research questions on different topics and levels were identified, which should be addressed in upcoming calls.

- Identify and communicate best-practise examples on data collection and sharing including related legislation and governance.
- Compare and adjust methods for data aggregation and indexing (normalization) that account for the non-linearity and regionalization of economic processes (e.g. inside and outside of hazard-prone areas).
- Develop methods to access and assimilate different open-source and crowd data and create useful applications.
- Develop methods for a better monitoring of exposure to natural hazards.
- Enhance efforts to develop, validate, transfer and compare different impact/loss models in different environments.
- Compile a systematic overview of the uncertainties of risk assessments (e.g. flood risk assessments) and identify large sources of uncertainty and ways to reduce them.
- Enhance interactions between different research fields, e.g. increase understanding and usability of hydrologic parameters in economic models.
- Create innovative ways to interact with policy makers.
- Support national and European platforms on disaster risk reduction and climate change adaptation (such as EFDRR, DKKV, PLACARD, Copernicus) so that interaction between science, industry and policy is further facilitated.

The workshop was organized by members of DKKV's scientific board from the Freie Universität Berlin (Prof. Dr. Uwe Ulbrich), Helmholtz Centre for Environmental Research (UFZ; Prof. Dr. Reimund Schwarze) and University of Potsdam (Prof. Dr. Annegret Thieken, Dr. Stephanie Natho) and funded by JPI Climate.

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