Brief for GSDR 2015

Loss Data Underpinning Disaster Risk Reduction

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Disaster Loss data in DRR decision-making

At present, our understanding of appropriate long-term disaster risk management is limited by the lack of in-depth knowledge on the impacts of disasters. In this regard, recording disaster impacts at detailed level is crucial for informed decision making, using methodologies that allow aggregation over space and in time. Scientific approaches for record disaster losses consistently and accurately are essential to move from undependable evidence driven mainly by media coverage to more systematic and proven datasets on disaster impacts. New partnerships between science and DRR actors are enabling just this.

Disaster loss data recording is the mechanism that links the science of risk assessment to the policy making for reducing disaster risks. Loss data collections are useful, for identifying trends and patterns in the data over time sand for tracking relationships between development and disaster risk (IFRC, 2005). As evidenced in the Global Assessment Report (GAR), loss data, recorded in national and global disaster databases are increasingly being used within risk modelling platforms to guide the decision-making processes of DRR (ISDR, 2013). When combined with ancillary data such as disaster risk management expenditures or demographic information (Gall et al., 2015), disaster loss data are essential indicators on the relevance of DRR policies in a broader context of development and climate change.

This note discusses the relevance of disaster loss data for evidence based policy in DRR and the main application domains of loss data within the European Union (EU) Member States.

The four application areas of disaster loss data

The multi-dimensional nature of disaster loss data calls for the establishment of a conceptual framework for loss data recording that comprises four main application areas (De Groeve et al., 2013, 2014): loss compensation, accounting, forensic analysis and disaster risk modelling. The information required for the four application areas is overlapping, even if the forensic and modelling applications require information at higher detail.

Disaster loss compensation

A fair and efficient solidarity mechanism and effective insurance markets are complementary approaches to recover from disasters. Most disaster loss databases in Europe are based on a collection of claims used in these compensation mechanisms. The drivers for loss data recording are mainly linked to public national compensation schemes (e.g. Belgium, Croatia, France, Slovenia, Spain, Sweden) as well as two important governance mechanisms: Public-Public Partnerships (PuP)[1] and Public Private Partnerships (PPP). In France, Mission Risques Naturels (MRN) provides evidence of the efficiency of PuP and PPP mechanisms for establishing and maintaing national disaster loss databases. Private and public partnerships that rely on cost-sharing allow developing open-access models and pilot innovative loss data management mechanisms.

Disaster loss accounting

Loss accounting is the principal motivation for recording the impact of hazards and aims to document the trends in time. High quality loss data with a good temporal and spatial resolution may be used to establish historical baseline for monitoring the level of impact on a community or country. In fact, disaster loss accounting is being considered as backbone for setting the baseline

[1] PuP entail cooperative arrangements between two or more public entities while PPP refer to arrangements between the public and private sectors whereby some of the services that fall under the responsibilities of the public sector are provided by the private sector, with clear agreement on shared objectives for delivery of public infrastructure and/ or public services.

(i.e. a decade of national observations on mortality and economic loss data) and measuring the progress towards the agreed targets within the post 2015 framework for disaster risk reduction. While not all countries have national disaster loss databases, the adoption of these targets and indicators based on national observations will represent a strong incentive for systematically recording loss data.

Disaster forensics

Fine scale disaster loss data recording generates crucial and unique evidence for disaster forensics. This allows to identify loss drivers by measuring the relative contribution of exposure, vulnerability, coping capacity, mitigation and response to the disaster, that provides the lessons learnt to improve disaster management. Disaster forensics collected for individual events is critical evidence for evaluating the effectiveness of specific disaster prevention measures, and disaster prevention policy as a whole. Disaster forensic studies rely largely on loss data. Tools are available, such as the Damage and Loss Assessment (DaLA) methodology developed by the Economic Commission for Latin America and the Caribbean (Global Facility for Disaster Reduction and Recovery (GFDRR), 2010). The DaLA methodology builds on loss data collection, recording and analysis with the purpose of identifying root causes of disasters and determining recovery and reconstruction needs. Over the last 40 years, the ECLAC has conducted specific loss assessments in a systematic manner generating historical evidence of the social and economic consequences these events have on the countries.

Disaster risk modelling

The worst disasters have not happened yet. This is a key message from UNISDR's Global Risk Assessment 2013. Losses of future disasters are estimated through probabilistic risk models. These require accurate loss data for calibrating and validating models, to infer vulnerabilities, loss exceedance curves and fragility (or damage) curves. Disaster risk model typically comprise three main modules: hazard, vulnerability and loss. The latter combines the hazard module and the exposure module to calculate different risk metrics, such as annual expected loss (AEL) and probable maximum losses (PML) for various return periods. The AEL and PML are used to compliment historical analysis and are particularly useful for decision makers in assessing the probability of losses and the maximum loss that can result from major future events. Additionally, these assessments can also incorporate climate change scenarios to help the governments in developing forward-looking adaptation strategies.

Figure 1. The four application areas of disaster loss data and their respective objectives

Loss data recording and risk assessment: the European landscape

The new European Union legislation on Civil Protection is paving the way for more resilient communities (European Commission, 2013). The legislation includes key actions related to DRR such as developing national risk assessments and the refinement of risk management planning. The provision of guidelines and methods of risk assessment and mapping – which take into account the work at the national level to ensure comparability among Member States – is considered as one of the highlights in the EU policies related to DRR. Harmonized loss data are essential elements of this process.

The main gaps and challenges for harmonised loss data recording with the EU were identified by an EU expert working group (De Groeve et al., 2014) as follows: i) the lack of guidelines and standards for loss data collection and recording, which prevent the aggregation of loss data et EU and global levels and ii) the absence of national legal frameworks and strong mandates, essential for the establishment of country-wide and multi-hazard loss databases.

The overview of the current practices in recording disaster loss data in EU Member States showed that the methodologies for loss data recording implemented in each country are appropriate for national their purpose and for the targeted application areas. However, to make the loss databases compatible within Europe and with international organisations they all would require adjustments. The loss recording practices also would need to be strengthened and expanded to include data useful beyond narrowly defined objectives and include, for prevention policy and disaster risk modelling.

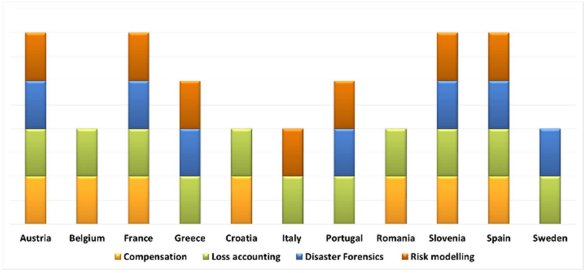

Figure 2. The main application areas of national disaster loss databases within EU Member States (De Groeve et al., 2014)

2 *Issues for consideration*

Despite their multi-purpose character and their value for DRR, disaster loss data exhibit shortcomings which lead to misinterpretation of the loss information: such as limited availability and several types of biases (Gall et al., 2009) that affect the quality, reliability and consistency of loss databases. To overcome these issues, the collection and recording of loss data require a minimum level of guidance at the national and international levels, if not standards in order to enable comparison of aggregated loss data. The EU expert working group on loss data proposed a set of minimum requirements for a loss data model that aims at facilitating data-sharing in a more transparent format. The same group is currently working towards the establishment of EU guidelines for sharing sound and interoperable data on disaster losses in an open data policy.

In addition to the identified challenges, the lack of historical information combined with the fat-tailed nature of disaster losses limits the ability to measure the outcome of DRR actions (Mitchell et al., 2014). A solution is in embracing probabilistic risk modelling which can generate metrics relevant for measuring resilience including expected causalities and expected average annualized losses.

The quantification of *expected disaster losses,* together with uncertainty quantification, would help evaluating i) the amount of acceptable loss, ii) the necessary investments in risk management strategies for reducing losses, iii) tracking risk-based loss information and iv) measuring progress against targets of the Sustainable Development Framework and the post 2015 framework for disaster risk reduction.

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