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Partnership for Risk Reduction

ENHANCE

Enhancing Risk Management Partnerships
for Catastrophic Natural Disasters in Europe

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Comments on the Open-ended Intergovernmental Expert Working Group Indicators and Terminology Relating to Disaster Risk Reduction

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1 Introduction and main comments

[1] The Sendai Framework for Disaster Risk Reduction (**SFDRR**) **is** a **commitment** to a transformative **change** in how natural and human-made risks are dealt with (van der Vegt et al., 2015; Wahlström, 2015a). In this hallmark year in which sustainable development, global cohesion and climate change have been tied in a single pull for a 'Future We Want' (UN, 2012), disaster risk reduction (DRR) plays an immense role. **Today's choices** forged by the Open-Ended Intergovernmental Working Group (OEIWG) **will influence** immensely what the transformation will be in practice and how the outcome-oriented progresses will be measured and certified. These choices will contribute to sculpting the physical and social **geography of risks in 2030**.

[2] As a result of neglected attention to disaster risk impacts in the past, it is not easy or even possible to portray the spatial and temporal patterns of disaster damage and losses with reasonable precision. This makes **measurement of progress difficult** if not impractical. Since years, the UNISDR and the international community have worked towards filling in the knowledge gaps and promoting culture of evidence and knowledge-based DRR (UNISDR, 2015a). With success. But as we try to remedy for the past negligence, we should not waste the **opportunity of collecting information and knowledge on full economic costs of disasters**, including spill-over and fiscal effects in terms of decreased tax revenues (OECD, 2015). The tabled proposal to measure only material damage of disasters as representative of economic impacts is one-sided and inconsistent. Not only does it omit sizeable economic and other effects of natural hazards that are endured in absence of any material damage, it also fails to serve the goal for which the SFDRR has been adopted, that is enhancing resilience of communities and societies. Albeit important, loss accounting should not hold sway over a thorough understanding of risks including their ripple and spill-over effects all over the increasingly interconnected economies. [***See detailed comments 2.1-2.4***].

[3] A sound understanding of risk does not only imply accounting for the past damage and losses. Natural hazards are outcomes of multiple stochastic processes. On temporal scale, the probability distributions span over years, decades and centuries. In some cases the probabilities of once-in-millennia or even rarer events are still relevant for today's decision making. These stochastic processes are often not stationary but respond to environmental changes, including climate change. Hazard manifestations of the same intensity and magnitude may also lead to diverse, sometimes significantly so, damage and losses, depending on the circumstantial factors. The vulnerability and susceptibility to harm are changing as our societies transform in demography, wealth, cohesion and use of technology. All this makes **outcome-oriented measurement of DRR progress a daunting task**. A **decade-long baseline** is unable to capture the changes in risk, let alone attribute these changes to a better disaster risk management prompted by the SFDRR. The suggestion to filter out '*outlier disasters*' (UNISDR, 2015b) when rating the progress is not helpful. The indicators of progress should not provide false assurance that a full, comprehensive and probabilistic risk assessment is not needed; it is. The enactment of the SFDRR should encourage countries and regions to better understand the multiple risks to which they are subjected. This will require risk modelling and simulation. An accounting system of registered damage and losses alone will meet the requisites of forward-looking disaster risk reduction. [***See detailed comments 3.1 – 3.2***].

[4] Since their inception in late 2000s, the **Global Platform** (GP) and **Global Assessment Report** (GAR) for Disaster Risk Reduction have filled a void in international collaboration at a high policy

level across science and policy. Over the time, the Global Platform has grown into becoming a premier event for risk professionals, experts, scientists and policy makers from all over the world to share experiences and success stories, and to showcase and demonstrate innovative solutions from any of the fields involved in the DRR. The GAR has developed into a fully-fledged exercise nearly equivalent to the reports of the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). The SFDRR bestows an extended mandate to both the GP and the GAR. The UNISDR and international community should seize this opportunity and devise collectively the makeover. The GAR should embrace a more in-depth analysis, and regionally conceived reviews and assessments that complement the global reports on climate change, and on biodiversity and ecosystem services.

[5] International and multi-stakeholder **partnerships** (MSPs) are pointed out throughout the SFDRR as an important component of the transformative DRR. However, neither the revised and extended terminology, nor the proposed indicators offer a view on what the partnership are or should be, what principles they should be obliged to, and how the performance of partnerships should be assessed and reported. Partnerships are not new *vehicles* of development, environmental, and disaster risk reduction agendas. But in the run-up to the World Summit on Sustainable Development (WSSD), held in Johannesburg in 2002, the MSPs have been elevated to equal (or almost equal) terms as the commitments arising from intergovernmental negotiation. Termed Type-II outcomes of the WSSD, the partnerships were brought to the front as a major method of achieving sustainable development (Wilson, 2005). The so-called Bali guiding principles (UN, 2002) delineated partnerships as voluntary and self-organizing commitments based on mutual respect and shared responsibility. The MSPs represents a step change away from sole government-centred to multilevel modes of global environmental governance (Calliari and Mysiak, 2015) in other domains, including disaster risk reduction (Calliari and Mysiak, 2013). [***See detailed comments 5.1***]

2 Specific comments and suggestions

[2.1] The proposed definition of «disaster damage» neither covers the entire range of disaster impacts nor does it emphasizes enough the causal link between the natural disaster and the damages experienced. We suggest changing the definition to '**measurable adverse change or impairment of tangible assets as an immediate and direct consequence of the hazardous event**'

Tying the damage and loss to physical 'destruction' may be too narrow in some situations. For example, deteriorated water quality as a result of industrial accident would not qualify as 'destruction' but rather a chemical alteration. The latter case may also lead to higher water treatment costs and hence costs of water supply in general, which according to the proposed terminology would need to be considered as indirect cost. We believe the definition should try to speak out more in detail the type of disaster outcomes that are to be considered damage. It may include **alteration** of (physical, biological and chemical) properties, and **inoperability** or **dysfunction** of the damaged assets.

[2.2] The proposed definition of «economic loss» can be made more explicit as '**economic value of the disaster damage and of the indirect economic costs where these are not accounted for in the cost of damage**'. The economic losses embrace economic value of both physical damage and market opportunities lost. Economic valuation is bound to purpose (e.g. indemnity, liability, recovery aid) and hence methods, and consequently the results of economic analysis may differ.

[2.3] The proposed definition of «direct economic loss» should limit the loss to value necessary to enable the beneficiary to return to the situation prevailing before the disaster occurred. It was suggested that for simplicity matter the replacement value of the destroyed assets should be considered. The replacement value is higher than the to-be-applied depreciated value or equivalents, and worse, its use may constitute unauthorized state aid. When the replacement value is the only basis on which one can determine the direct economic loss, the economic loss should not exceed the estimated cost of restoring the assets *status quo ante*. This means that if the newly replaced asset is functionally better than the impaired one (according to the principle *Building back Better*), only a part of the replacement costs should be taken into account – one that is deemed equivalent to restoring the damaged asset to its previous functionality. We suggest changing the definition to '**Economic value of the disaster damage. The direct economic loss should be based on the repair or restoration costs, or the depreciated value of the affected assets**'.

Sometimes disaster damage is not associated with physical harm. Volcanic ash crisis (such as that experienced in Europe in 2010) results in disruption of transportation network as the airspace blocks are closed for safety reasons. Airborne ash particles pose a significant health hazard; and in excessive volumes ash can lead to collapse of roofs and other material destruction. Volcanic ash can damage airplane engines which leads almost certainly to airplane accidents. But a preventive closure of airspace, in absence of any physical destruction, would not qualify as damage according to the proposed terminology. The costs of cancelled flights or perished goods stranded would qualify as indirect losses while normally they are seen as direct costs of airspace closure.

[2.4] The proposed definition of «indirect economic loss» is too narrow and partial. The indirect losses are specified as 'decline in value added' as a direct consequence of 'direct costs'. This holds true for productive sectors such as manufacturing as a result of disrupted production processes and declined productivity. But the indirect losses arise to individuals, households, communities and businesses. We suggest changing it to '**Indirect economic losses include but are not limited to production or revenue losses due to the full or partial suspension of economic activities, decline of productivity, or higher production costs; and decrease in market value of the damaged asset. The indirect losses are additive to direct economic loss only if or only for the part not considered already a part of direct damage and loss.**'

The loss of non-market services such as those provided by healthy ecosystems (e.g. regulatory service for peak river discharge, or removal of water pollutants) are typically not accounted for. Their replacement however incurs additional costs that will be recorded through increases in added value of water services.

[3.1] The large scale risk assessment models can help improving shared understanding and appreciation of risk as an important ingredient for designing effective and efficient risk management solutions (De Groeve et al., 2014; Wahlström, 2015b; Ward et al., 2015). We suggest **improved assessments of natural hazard risks at the multiple scales** as an additional basis for measuring progress made under the SFDRR**.** These are needed for identifying impacts current- and future climate (-variability), so as to investigate and design policies that are able to cope with future risks and limit likely impacts of climate change. Because natural hazards and consequences of climate change are locally determined, local risk assessments are an important input for the design of adaptation policies (e.g. Aerts et al., 2014). On a broader scale, natural disaster risk assessments and how these are influenced by climate change can contribute to better understanding of the economic costs of climate change, of which current estimates often neglect extreme weather events (van den Bergh and Botzen, 2014).

There are basically two approaches to arrive at distributions of natural disaster risks: statistical risk assessments and catastrophe models. Statistical approaches look at the past records of loss data, and estimate risk from historical loss data using extreme value theory. A fundamental challenge is how to model the rare phenomena that lie outside the range of any available observation, and cam be accounted for in extreme value theory methods. Another approach is the use of catastrophe models. These are computer-based models that estimate the loss potential of natural disasters (Grossi and Kunreuther, 2005). This is usually done by overlaying the properties or assets at risk - exposure module, such as classification based on land cover dataset - and the potential sources of natural hazards (hazard module) in a specific geographical area. A vulnerability module estimates the damage (e.g. of a flood) that occurs based on a function of the intensity hazard (e.g. inundation depth) and value of the exposure (e.g. the value of a flooded property). An alternative modelling method to catastrophe models are economic models which estimate the influence of a hazard on economic losses, such as reduced productivity, for specific sectors or the broader macro-economy.

[3.2] It was suggested to apply statistical normalization technique to minimize the distorting effect of 'outlier' disasters. It was suggested to apply statistical normalization technique to minimize the distorting effect of 'outlier' disasters. This would imply that the frequency (probability) of the natural phenomena are known or can be determined, which is practical for some hazards but generally requires observational records of sufficient length. As similar records are not available for all countries, the normalization may distort the analysis and conclusions based on it.

[5.1] The extended terminology should include a definition of the partnerships. A specific guidance should be developed to monitor progress made through partnerships and assess the (improved) performance.

The European project **ENHANCE** (Enhancing risk management partnerships for catastrophic natural hazards in Europe; http://www.enhanceproject.eu) has analysed various multiple-stakeholder partnerships (MSPs) in in different context and situations. We have found that despite broad agreement for closer collaboration between public and private actors in response to rising risk levels many challenges remain for translating this into innovative solutions. **Public-Private Partnerships** (PPP) in disaster insurance can serve as role models for a joint bearing of responsibilities and efficient risk-sharing. Johansen (2006) summarised the principles and preconditions of successful PPPs as (i) being shaped through constructive dialogues (between public and private entities) and conscious of mutual principles and limitations, (ii) safeguarding competitive environment; and (iii) respecting, if not exploiting, risk-differentiated prices as incentive and reward for individual or collective risk prevention and protection. Ideally, private insurers (should) 'have the opportunity to carry on using their savoir-faire in an environment of mutual understanding' (ibid).

Our findings exemplify that public and private stakeholders have very different constellations and problem definitions. Therefore stakeholder engagement is important to discover current barriers, perceived or otherwise, which may be inhibiting innovative solutions or the development of new partnerships. For example, it may be that the level of risk itself is seen as already too high for the private sector to engage, or the stakeholders may not have a suitable platform upon which to engage. We have further explored this in the context of disaster insurance: The current discourse about disaster insurance highlights the key challenges of managing current risks and preparing for future climate risks: at the core lies the issue of collective versus individual responsibility, and solidarity versus market-based approaches. This is where the biggest potential for global policy lies - in the facilitation of DRR and adaptation, which will determine risk levels and viability of insurance going forward. However, the design and operation of insurance can also play a role in this. As the ENHANCE examples show, there are significant barriers facing public and private stakeholders. This requires policy action—at global and national, even regional level. The key question therefore is how to determine and define the roles of industry and policy-makers, recognizing that this is likely to differ from country to country. This is an area where closer collaboration between academia, industry and government is needed to proceed (Surminski et al., 2015).

3 References

Aerts, J. C. J. H., Botzen, W. J. W., Emanuel, K., Lin, N., de Moel, H. and Michel-Kerjan, E. O.: Evaluating Flood Resilience Strategies for Coastal Megacities, Sci. , 344 (6183), 473–475 [online] Available from: http://www.sciencemag.org/content/344/6183/473.short, 2014.

Van den Bergh, J. C. J. M. and Botzen, W. J. W.: A lower bound to the social cost of CO2 emissions, Nat. Clim. Chang., 4(4), 253–258 [online] Available from: http://dx.doi.org/10.1038/nclimate2135, 2014.

Calliari, E. and Mysiak, J.: Renewed international commitment for Disaster Risk Reduction, in A Best Practices Notebook for Disaster Risk Reduction and Climate Change Adaptation: Guidance and Insights for Policy and Practice from the CATALYST Project. The World Academy of Sciences (TWAS), Trieste, Italy., edited by M. Hare, C. van Bers, and J. Mysiak., 2013.

Calliari, E. and Mysiak, J.: Partnerships for a better governance of natural hazard risks, Int. J. Risk Assess. Manag., 2015.

De Groeve, T., Thielen-del Pozo, J., Brakenridge, R., Adler, R., Alfieri, L., Kull, D., Lindsay, F., Imperiali, O., Pappenberger, F., Rudari, R., Salamon, P., Villars, N. and Wyjad, K.: Joining Forces in a Global Flood Partnership, Bull. Am. Meteorol. Soc., 96(5), ES97–ES100, doi:10.1175/BAMS-D-14-00147.1, 2014.

Grossi, P. and Kunreuther, H. C.: Catastrophe Modeling: A New Approach of Managing Risk, Springer, New York., 2005.

Johansen, E. B.: Between Public and Private – Insurance Solutions for a Changing Society, Scand. Insur. Q., (2) [online] Available from: http://www.nft.nu/en/between-public-and-private-insurance-solutions-changing-society, 2006.

OECD: Disaster Risk Financing. A global survey of pra ctices and challenges, OECD Publishing, Paris., 2015.

Surminski, S., Aerts, J., Botzen, W., Hudson, P. and Mysiak, J.: ENHANCE Policy Brief 2 Insurance instruments and disaster resilience in Europe –insights from the ENHANCE project (www.enhanceproject.eu), 2015.

UN: Guiding Principles for Partnerships for Sustainable Development (“type 2 outcomes”) to be Elaborated by Interested Parties in the Context of the World Summit on Sustainable Development (WSSD) Explanatory note by the Vice-Chairs Jan Kara and Diane Quarless, 2002.

UN: Resolution adopted by the General Assembly on 27 July 2012, A/RES/66/288. The future we want. United Nations, General Assembly. Sixty-sixth session. 11 September 2012, 2012.

UNISDR: Annex 2 GAR-Global Assessment Report on Disaster Risk Reduction 2015, Loss data and extensive risk analysis, 2015a.

UNISDR: Background Paper Indicators to Monitor Global Targets of the Sendai Framework for Disaster Risk Reduction 2015-2030: A Technical Review Prepared by An expert group meeting of scientific and academic organizations, civil sector, private sector and United N, 2015b.

Van der Vegt, G. S., Essens, P., Wahlström, M. and George, G.: Managing risk and resilience, Acad. Manag. J., 58(4)August, 971–980 [online] Available from: 10.5465/amj.2015.4004, 2015.

Wahlström, M.: New Sendai Framework Strengthens Focus on Reducing Disaster Risk, Int. J. Disaster Risk Sci., 6(2), 200–201, doi:10.1007/s13753-015-0057-2, 2015a.

Wahlström, M.: Preface, Landslides, 12(4), 629, doi:10.1007/s10346-015-0590-5, 2015b.

Ward, P. J., Jongman, B., Salamon, P., Simpson, A., Bates, P., De Groeve, T., Muis, S., de Perez, E. C., Rudari, R., Trigg, M. A. and Winsemius, H. C.: Usefulness and limitations of global flood risk models, Nat. Clim. Chang., 5(8), 712–715 [online] Available from: http://dx.doi.org/10.1038/nclimate2742, 2015.