Environment and Disaster

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The natural environment underpins our quality of life, economies, cultures, social stance and national identities. To sustain a certain development path, well-functioning ecosystems, of which biodiversity is a crucial part, are essential to ensure ecosystem services such as clean drinking water, unpolluted air, decomposition of waste for fertile topsoil, food production, carbon sequestration, crop pollination and the control of pests and diseases[1]. These services provide the environmental and human security for present and future development. However, on our current development tract, some believe that we are rapidly approaching our planetary boundaries[2] and some talk of the human race approaching a "technological singularity[3]" within the Anthropocene. Furthermore, during the last century, several powerful natural and anthropogenic induced disasters occurred in different parts of the world, in both technologically advanced and developing countries. The types of natural hazards that triggered these disasters varied from the unpredictable occurrence of earthquakes and tsunamis, to more predictable seasonal floods, periodic storms and heat waves. Other less immediate, slowly evolving and sometimes smaller compounding hazards such as recurring seasonal wildland fires, drought and environmental degradation have affected even more people, with potentially greater costs for their future, livelihoods, the environment, and their human security. However, the progression and evolution of the study of hazards and disasters and their effects has long progressed beyond a pure focus on the consequences and the human reaction to them. The tide has shifted to a much more intangible and sometime less understood phenomena which we call extensive disaster risk, vulnerability and now also resilience. Disaster risk, and risk in general, is an abstract concept. It has various meanings in different contexts (e.g. financial risk compared to agricultural risk). Its interpretation and application varies across disciplines, and has spatial and temporal connotations.

An emerging trend in disaster risk reduction and disaster risk management discourse towards the post-2015 era, emphasise the need for our understanding of disaster risk to be rooted in development thinking (although this is not a new argument in itself[4]), with an emphasis on human/nature interactions. This requires a new framing of the disaster risk

[1] Djoghlaf, A., & Dodds, F. 2011. Biodiversity and Ecosystem Insecurity. London: Routledge.
[2] Sachs, J. D. 2009. Transgressing Planetary Boundaries. *Scientific American*, *301*(6), 36–36. doi:10.1038/scientificamerican1209-36
[3] Eden, A. H., Moor, J. H., Soraker, J. H., & Steinhart, E. 2012. *Singularity Hypotheses: A Scientific and Philosophical Assessment*. Heidelberg: Springer.
[4] O'Keefe, P., Westgate, K., & Wisner, B. 1976. Taking the naturalness out of natural disasters. *Nature*, *260*(5552), 566–567. doi:10.1038/260566a0

problem by moving away from the overemphasis on natural and anthropogenic hazards, to that of understanding underlying vulnerability and underlying drives which generate disaster risk in the first place, and limits at-risk populations to achieve higher levels of resilience through development. It thus reflects the complex interrelationships between nature, development and society. To achieve the above assumes an immediate break in traditional disciplinary focusses (silos if you may). It assumes that disaster risk is created in social- and socio-ecological systems and is the product of failed development. It challenges us in terms of our traditional belief in *realist*[5] and *constructivist*[6] schools of thought.

Thus, in assessing the future of disaster risk research, we need to soberly reflect on our core understanding and application of the conceptualisation of disaster risk. Most of the research into disaster risk remained framed in the negative. We assume that the presence of disaster risk means *danger*, and not also *opportunity*. We research events to understand human responses, and provide inputs to better disaster preparedness. The presence of disaster risk is not seen as a failure of development but rather an input to unsustainability[7]. Emphasis is rarely placed on the positive social and economic attributes that can result from effectively managing risk. Even more, challenging the systems (e.g. political, social, cultural, and economical) and processes (e.g. decision-making, compliance, enforcement, rights, and obligations) which generates unacceptable levels of disaster risk, have been poor. In some instances the very structures and systems creating disaster risks is maintained in the name of human and environmental security[7]. There is furthermore an assumption that we need to invent new systems for disaster risk reduction to be effective, which is underscored by international rhetoric (e.g. "creating a culture of safety" as per the HFA).

This tendency has been reinforced by climate change discourse and research, which emphasises extreme natural events instead of the long-term risk creation processes. This has served to further remove disaster risk reduction from policy choices on economic, social and territorial development. Further, very little research is undertaken on the drivers of extensive risk and making cross-sectoral and cross-disciplinary linkages between the climate change, disaster reduction and development domains within social- and socio-ecological systems. Disaster risk research has almost become "an independent field of inquiry, rather than a much more complex, integrated, and mutually influencing process, where financial, health, economic, environmental, political and social risks are considered as both facets, and at the same time contributing factors, in an interdependent process of risk creation, accumulation, reduction, transference, and at some point, manifestation"[8].

In looking forward to the post-2015 era, we need to find "broader" language to link various disciplines. We need transdisciplinary engagement. Using transdisciplinarity as paradigm[9], with sustainable development as the starting point (i.e. the real world problem) will widen the scope and focus of disaster risk, and bring "non-traditional" disciplines to the table. Sustainable development therefore implies the construction and accumulation, not of risk, but of resilience and transformative capabilities in society and its communities, based on equity and solidarity within balanced socio-ecological adaptive systems. That being said, resilience should in the same vain be understood as a theoretical construct not capable of

[5] "Nature as enemy" which must be assessed, understood and contained.
[6] Risk is created in social systems.
[7] Mostly within four connected domains: ecology, economics, politics and culture.
[8] Lavell, A. & Maskrey, A. 2013. *The Future of Disaster Risk Management.* Discussion paper derived from an open debate at the Latin American Social Science Faculty (FLACSO). San Jose, Costa Rica. 18-19 April 2013. (unpublished)
[9] Van Niekerk, D. 2012. Transdisciplinarity: the binding paradigm for disaster risk reduction. Professorial Inauguration Lecture. Potchefstroom: dspace.nwu.ac.za.

being “measured”[10]. Resilience, like disaster risk is spatially and temporally bound, and much less understood and research within the social sciences than in the natural sciences[11].

Thus, what are we to do? Firstly an acknowledgement that disaster risk, climate change, sustainable development and resilience functions within incredible complex systems and environments, which cannot be construed as a specialised research domain (i.e. disaster risk reduction), neither measured though a set of indicators. Secondly, a realisation that we need a new framing of the disaster risk problematic in a new development-centric paradigm[12], to broaden its scope and identify its manifestation in various disciplines. Thirdly, engage in true transdisciplinary research where the phenomena (e.g. (un)sustainable development) is viewed as the real life problem and not disaster risk per se, taking into account the differences and interaction between anthropogenic- and socio-ecological systems. Fourthly, focus on societal transformation (in all its manifestations) as key to addressing the underlying risk drivers. Lastly, we need to find much needed convergence in disciplinary focus on climate change, disaster risk and development.

[10] Hinkel, J. 2011. “‘Indicators of vulnerability and adaptive capacity’”: Towards a clarification of the science–policy interface. *Global Environmental Change*, *21*(1), 198–208. doi:10.1016/j.gloenvcha.2010.08.002

[11] Note should be taken of the fact that resilience thinking in the natural sciences has been around much longer than in the social sciences. The social construct of resilience remains abstract and difficult to grasp.

[12] This could be linked to building on the idea of “bounded growth” as per the work of Geoffrey West, especially within the notion of rapid urbanisation, consumerism and singularity. See: Bettencourt, L., & West, G. 2010. A unified theory of urban living. *Nature*, *467*(7318), 912–913. doi:10.1038/467912a