

Transforming disaster risk reduction for more inclusive, equitable and sustainable development

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This article highlights three key areas in which efforts to reduce the underlying causes of vulnerability and drivers of risk to environmental hazards need to be improved in order to create more inclusive, equitable and sustainable development: 1) the role of context and culture in creating risk, 2) the need to better link disaster risk reduction (DRR), climate change adaptation (adaptation) and development, and 3) the enabling of transformative change.

1. Understanding context and culture in influencing vulnerability and resilience

Arguably, one of the most critical areas for improving vulnerability and risk reduction efforts is our lack of understanding of how context and culture, including organisational culture, influence the vulnerability and resilience of people at risk (IFRC, 2014; Thomalla et al., in press).

Contextual factors (e.g. cultural belief systems, social norms, economic systems, governance structures, and contextualised framings of problems and solutions) influence vulnerability and resilience levels to risk. However, our current understanding of culture in the context of risk is limited to acknowledging its importance in shaping perceptions, values, and beliefs and influencing how people conceptualize and

respond to risk (Thomalla et al., in press). Most risk-culture linkages (found in Dekens,

2007, Gaillard and Texier, 2010, Mercer et al., 2007, Schipper, 2010) have been too narrowly defined or are ancillary outcomes of research that focused on other questions. Cultural aspects are often overlooked in externally designed DRR activities designed given the difficulty in addressing them (Thomalla et al., in press). Limited understanding persists of how complex contextual and cultural factors and processes combine in different contexts to determine differential vulnerability and resilience within and across places (Calgaro et al., 2014) posing barriers to DRR (Kulatunga, 2010).

Much DRR research fails to capture the complexity of vulnerability and its contextualised manifestation. Focusing on individual components of the social-ecological system neglects the complexity of multiple interactions and the resultant behaviour of the system as a whole (Clark and Dickson, 2003). Decision-makers are left with incomplete information and abstract ideas that fail to tackle context-specific DRR issues (C. Benson at ADB. 2014. pers. comm. 30 May). The recent World Disaster Report (IFRC, 2014) demonstrates that many organisations neglect culture in their DRR planning. Organisations often assume that people share their DRR priorities, logic framework and 'rationality' in the face of hazards, overlooking the potential cultural clashes that may arise with target communities. Consequently, many DRR efforts are ineffective, being based on invalid assumptions that lack honest ground-truthing. To truly address the underlying causes of risk, research

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and policy must better address social and cultural aspects in the post-2015 environment.

2. Linking efforts in DRR, adaptation and development

A number of commentators highlight the urgent need to understand DRR and adaptation in the context of wider social and economic development (Cardona et al., 2012; Schipper et al., under review; Schipper and Pelling, 2006; Thomalla et al., 2006) as disaster risks evolve due to a range of complex interacting social, economic, political and environmental factors.

Current pathways are unsustainable as growing populations and deepening social inequalities couple with increasing, cascading and teleconnected risks. Disasters now taking place are manifestations of outdated models in which risks were 'managed' through incremental adaptation. In the face of increasing risks, these models are resulting in patterns of exploitation, degradation and loss – of biodiversity, economic assets, culture and cultural heritage, mental and physical health and well being (Jaeger et al., 2007; Benzie, 2015) as well as human rights (Bronen and Chapin, 2013; Veland et al., 2013).

Development can exacerbate disaster risks, both long-term by increasing greenhouse gas emissions and short-term by worsening hazards. Yet, development is key to reducing vulnerability (e.g. by improving basic infrastructure). Similarly, disaster impacts can interfere with development pathways and outcomes (Schipper et al. under review). The development implications of DRR and adaptation and vice versa are perceptible, yet institutional barriers, including differences in language and methods, have reinforced 'siloed' thinking and blocked linkages between the three communities of practice (see Schipper and Pelling, 2006; Lavell and Maskrey, 2013). A rethink of current policies and improved coordination and complementary action between the three areas is crucial.

3. Transforming society to reduce risks constructed through the interaction of poor development choices and pathways with environmental hazards

A transformational change in DRR, adaptation and development governance is needed to reduce vulnerability and create development patterns that are more inclusive, equitable and sustainable (e.g., Oliver-Smith, 2013; Pelling, 2014; Schipper et al., under review).

Pelling (2011, p. 50) describes transformation as 'the deepest form of adaptation indicated by reform in overarching political-economy regimes and associated cultural discourses on development, security and risk'. The IPCC (2012, p. 564) defines transformation as 'the altering of fundamental attributes of a system'.

However, what types of transformations are actually needed? Evidence from recent disasters shows that building long-term resilience to environmental risks requires a fundamental shift away from current top-down and expert-driven governance approaches that are often characterized by vertical networks of power and influence and focus on technological quick-fixes and protecting prevailing economic interests. To address the deeply contextual issues facing disaster-affected communities, governance must facilitate more bottom-up and multi-stressor based approaches that build trust through greater transparency and accountability, include diverse stakeholders, incorporate local knowledge and experience, and place greater value on non-economic assets (Thomalla and Larsen, 2010; Thomalla et al., 2009). As disasters transcend political and national borders, horizontal agencies can also better facilitate inter-agency and cross-boundary collaboration, (Boyland et al., forthcoming).

Although incorporating a diversity of stakeholders to encourage knowledge-sharing is beneficial,

governance can become increasingly disconnected and fragmented (Alexander, 2006). The challenge is to bring together actors across and within vertical and horizontal networks to foster complementary, rather than conflicting, relationships, through co-governance or co-management to produce mutually-beneficial policies (Berkes 2009; Cundill & Fabricius, 2009; Evans et al., 2011).

External organisations may bring in large flows of money, supplies and expertise, gradually overriding the state's responsibility to provide basic services (Bello, 2006). The humanitarian aid scene now incorporates a multitude of actors whose activities are increasingly blurred with those of national and local governments. A careful balance is needed between the role of governments and organisations, to not overstep government efforts or deepen dependency. Moreover, informal governance institutions such as local village councils and religious institutions have a crucial role as they often have a strong familiarity with, and often trusted by, community members.

Criteria and indicators for assessing transformative governance

Having strong institutions in place does not guarantee effective reduction of risk and vulnerability. An analysis of the self-assessments of progress of 121 local governments in DRR by Johannessen et al. (2014) found that local governments tended to self-report good progress in DRR capacity. However, 'progress' in DRR is often equated with simply establishing a DRR unit within existing governance structures, without necessarily integrating this work with other units. These assessments frequently focused on hazards and physical interventions, neglecting the socio-economic, institutional, political, cultural and educational aspects of risk. This is likely an outcome of the prevailing organisational culture that determines assessment indicators and constitutes a barrier for identifying more

comprehensive assessment criteria (Johannessen et al. 2014).

New ways to elicit the perceptions, needs and priorities of different stakeholders

To address issues of both community and organisational culture 'blindness', and siloed thinking we argue that the use of holistic, 'mixed-method' approaches are key. Such methods are used to co-construct empirical evidence, that is: data generated from observing, interviewing, game-playing, and other participatory approaches including the knowledge of, or co-learning with, the stakeholders, rather than a top-down approach based on the *a priori* assumptions of researchers outside of the 'system' or context. One example is the process of using Knowledge Elicitation Tools (KnETs), developed by anthropologists and computer scientists (Bharwani, 2006) to explore current and future decision processes guided by the 'world-view' of informants and an iterative, ethnographic and participatory 'game-interview' process to reveal the 'tacit' drivers of decision-making. In the past, researchers have combined KnETs with agent-based social simulations to understand how individual decision-making which is influenced by seasonal forecast information, perceptions of risk, as well as day-to-day stressors (Bharwani et al., 2005, 2015), can result in systemic outcomes. These methods, used here in community-based setting, could be used to explore organisational culture in combination with socio-institutional network analysis, for example, combining quantitative approaches with bottom-up participatory ones (cf. Varela-Ortega et al., 2014).

Conclusion

DRR efforts are at a crossroads (Alexander and Davis, 2012; Oliver-Smith, 2013) and the post-2015 environment provides an opportunity to reshape the agenda. The post-2015 DRR framework discussions are occurring at the same time as the formulation of the new Sustainable Development Goals and a new

UNFCCC agreement on international climate change action. At this critical junction, researchers must enhance understanding of the root causes of vulnerability and risk through a contextual and cultural lens, strengthen linkages between different communities of practice, and explore potential adaptive processes and transformations. Lastly, a critical evaluation of the post-2015 agenda informed by issues of power, competing value systems, social equity and justice is crucial.

References

Alexander, D. (2006). 'Globalization of disaster: Trends, problems and dilemmas'. *Journal of International Affairs*, 59(2), 1-22.

Alexander, D. and Davis, I. (2012) 'Disaster risk reduction: An alternative viewpoint'. *International Journal of Disaster Risk Reduction*, 2, 1–5. doi:10.1016/j.ijdr.2012.10.002.

Bello, W. (2006). 'The rise of the relief-and-reconstruction complex'. *Journal of International Affairs*, 59(2), 281-296.

Benson, C. Interviewed by Thomalla, F. (30 May 2014).

Benzie, M. (2015). *Adaptation Without Borders-Indirect Impacts of Climate Change*. Stockholm Environment Institute. Available from: <https://weadapt.org/initiative/adaptation-without-borders>. [20 January 2015].

Berkes, F. (2009). 'Evolution of co-management: Role of knowledge generation, bridging organizations and social learning'. *Journal of Environmental Management*, 90, 1692-1702.

Bharwani, S., Bithell, M., Downing, T.E., New, M., Washington, R and Ziervogel, G. (2005) 'Multi-agent modelling of climate outlooks and food security on a community garden scheme in Limpopo, South Africa'. *Philosophical Transactions of the Royal Society B-Biological Sciences* 360(1463): 2183-2194.

Bharwani, S. (2006). 'Understanding Complex Behaviour and Decision Making Using Ethnographic Knowledge Elicitation Tools (KnETs)'. *Social Science*

Computer Review, 24(1). 78–105. DOI:10.1177/0894439305282346.

Bharwani, S., Coll Besa, M., Taylor, R., Fischer, M.D, Devisscher, T. and Kenfack, C. (2015) 'Identifying salient drivers of livelihood decision-making in the forest communities of Cameroon: Adding value to social simulations'. *Journal of Artificial Societies and Social Simulation*.

Boyland, M., Thomalla, F. and Lebel L. (forthcoming) 'Linking short-term responses and long-term recovery following major disasters: building post-disaster resilience in the context of loss and damage'. Unpublished manuscript. Stockholm Environment Institute, Bangkok, Thailand.

Bronen, R. and Chapin, F. S. (2013) 'Adaptive governance and institutional strategies for climate-induced community relocations in Alaska'. *Proceedings of the National Academy of Sciences*, 110(23). 9320–25. doi:10.1073/pnas.1210508110.

Calgaro, E., Lloyd, K. & Dominey-Howes, D. (2014) 'From vulnerability to transformation: A framework for assessing the vulnerability and resilience of tourism destinations in a world of uncertainty'. *Journal of Sustainable Tourism*, 22(3), 341-360.

Cardona, O.-D., van Aalst, M. K., Birkmann, J., Fordham, M., McGregor, G., et al. (2012) 'Chapter 2: Determinants of Risk: Exposure and Vulnerability'. *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC)*, H. Decamps and M. Keim (eds.). Cambridge University Press, Cambridge U.K. and New York NY USA. 65–108.

Clark, W. C. & Dickson, N. M. (2003) 'Sustainability Science: The emerging research program'. *Proceedings of the National Academy of Sciences of the United States*, 100, 8059-8061.

Cundill, G., & Fabricius, C. (2009). 'Monitoring in adaptive co-management: Toward a learning based approach'. *Journal of Environmental Management*, 90, 3205-3211.

Dekens, J. (2007) 'Local Knowledge for Disaster Preparedness: A Literature Review'. Kathmandu:

International Centre for Integrated Mountain Development.

Evans, L., Cherrett, N., & Pemsil, D. (2011). 'Assessing the impact of fisheries co-management interventions in developing countries: A meta-analysis'. *Journal of Environmental Management*, 92, 1938-1949.

Gaillard, J.-C. and Texier, P. (2010) 'Religions, Natural Hazards, and Disasters: An Introduction'. *Religion*, 40, 81-84.

IFRC (2014) *World Disasters Report 2014: Focus on Culture and Risk*. International Federation of Red Cross and Red Crescent Societies, Geneva, Switzerland.

IPCC (2012) *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*. A Special Report of the Intergovernmental Panel on Climate Change Working Groups I and II (Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley, eds.). Cambridge University Press, Cambridge, UK, and New York. <http://ipcc-wg2.gov/SREX>.

Jaeger, J., Kok, M. T. J., Mohamed-Katerere, J., Karlsson, S. I., Lüdeke, M. B., et al. (2007) 'Chapter 7: Vulnerability of Human-Environment Systems: Challenges and Opportunities'. *Global Environment Outlook GEO-4 United Nations Environment Programme (UNEP)*, Nairobi, Kenya. 301-60.

Johannessen, Å., Han, G. and Rosemarin, A. (2014) *Urban Disaster Risk Reduction (DRR) and Resilient Cities: Progress of 121 Local Governments*. Stockholm Environment Institute.

Kemp-Benedict, E. J., S. Bharwani and M. D. Fischer (2010). 'Using Matching Methods to Link Social and Physical Analyses for Sustainability Planning'. *Ecology and Society* 15(3):4.

Kulatunga, U. (2010). 'Impact of culture towards disaster risk reduction', *International Journal of Strategic Property Management*, 14(4), 304-313.

Lavell, A. and Maskrey, A. (2013). The future of disaster risk management: an on-going discussion. Lavell, A. and A. Maskrey (2013). The Future of

Disaster Risk Management: An On-Going Discussion. UNISDR & FLACSO. Retrieved from <http://www.unisdr.org/we/inform/publications/35715> (accessed December 18, 2014).

Mercer, J., Dominey-Howes, D., Kelman, I. and Lloyd, K. (2007) 'The Potential for Combining Indigenous and Western Knowledge in Reducing Vulnerability to Environmental Hazards in Small Island Developing States'. *Environmental Hazards*, 7, 245-256.

Oliver-Smith, A. (2013) 'A matter of choice'. *International Journal of Disaster Risk Reduction*, 3, 1-3. doi:10.1016/j.ijdr.2012.12.001.

Pelling, M. (2011) 'Resilience and Transformation'. Climate change and the crisis of capitalism, M. Pelling, D. Manuel-Navarrete, and M. R. Redcliff (eds.). Routledge, New York.

Pelling, M. (2014) 'Transformation: A Renewed Window on Development Responsibility for Risk Management'. *Journal of Extreme Events*, 01(01). 1402003. doi:10.1142/S2345737614020035.

Schipper, E. L. F. (2010) 'Religion as an Integral Part of Determining and Reducing Climate Change and Disaster Risk: An

Agenda for Research'. In: VOSS, M. (ed.) *Der Klimawandel: Sozialwissenschaftliche Perspektiven*. Wiesbaden: VS Verlag.

Schipper, L. and Pelling, M. (2006) 'Disaster risk, climate change and international development: scope for, and challenges to, integration: Disaster Risk, Climate Change and International Development'. *Disasters*, 30(1). 19-38. doi:10.1111/j.1467-9523.2006.00304.x.

Schipper, E. L. F., Thomalla, F., Vulturius, G., Johnson, K. and Klein, R. J. T. (under review) *Climate Change and Disaster Risk Reduction: Background Paper for Research Area 17: Climate Change Adaptation and Mitigation. UNISDR Global Assessment Report 2015*. Stockholm Environment Institute.

Thomalla, F., Downing, T., Spanger-Siegfried, E., Han, G. and Rockström, J. (2006) 'Reducing hazard vulnerability: towards a common approach between disaster risk reduction and climate adaptation'.

Disasters, 30(1). 39–48. doi:10.1111/j.1467-9523.2006.00305.x.

Thomalla, F., Larsen, R. K., Kanji, F., Naruchaikusol, S., Tapa, C., Ravesloot, B. and Ahmed, A. K. (2009) *From Knowledge to Action: Learning to Go the Last Mile. A Participatory Assessment of the Conditions for Strengthening the Technology – Community Linkages of Tsunami Early Warning Systems in the Indian Ocean*. Stockholm Environment Institute, Macquarie University, Asian Disaster Preparedness Centre, and Raks Thai Foundation.

Thomalla, F., Smith, R. and Schipper, E. L. F. (in press) 'Cultural Aspects of Risk to Environmental Changes and Hazards: A Review of Perspectives'. *The Impact of Disasters on Livelihoods and Cultural Survival: Opportunities, Losses, and Mitigation*, M. Companion (ed.). CRC Press, Boca Raton, Florida, USA.

Varela-Ortega, C., Blanco-Gutiérrez, I., Esteve, P., Bharwani, S., Fronzek, S. and Downing, T. E. (2014). How can irrigated agriculture adapt to climate change? Insights from the Guadiana Basin in Spain. *Regional Environmental Change*. doi:10.1007/s10113-014-0720-y.

Veland, S., Howitt, R., Dominey-Howes, D., Thomalla, F. and Houston, D. (2013) 'Procedural vulnerability: Understanding environmental change in a remote indigenous community'. *Global Environmental Change*, 23(1). 314–26. doi:10.1016/j.gloenvcha.2012.10.009.