Disaster Risk Communication:
Dialogues for Reducing Extensive Risk

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Risk Interpretation and Action

How do scientists, practitioners and people at risk make decisions, individually and collectively? Social theory, psychology and learning theory have all addressed this question but somewhat independently. This has led to a number of discontinuities in the analysis of risk communication and perception and gaps in research and practitioner activity (and funding). The result is a number of unanswered questions:

Can placing learning in the centre of science and policy lead to a paradigm shift for understanding and acting on resilience and transformation? Can learning theory (including social learning) connect with action research and knowledge exchange work to create a paradigm shift for risk management – one built on knowledge and learning processes and perception?

What are the practical obstacles to a more flexible and knowledge rich humanitarian and development sector and professional practice? How do people's decisions, perhaps due to social norms and perceived or actual constraints on their freedom of choice, diverge from evaluations of risk? How can we better theorise and research the relationships between organisational and social structures on the one hand and individual agency on the other to better understand individual and social learning and action in risk management organisations including humanitarian and development agencies?

How much emphasis should be placed on risk forecasting versus communication? If the step change in risk avoidance is to come from risk communication why is this consistently underfunded compared to hazard modelling? Are the right questions being asked?

Beginning to address these questions is helped by considering two overarching concerns that reflect the challenges and scope for communicating between science, policy and practice communities, reflect the vested interests inherent in each group and the norms and values that shape dialogue and priority setting. Improving communication on risk is not about improving the coherence of messages. Rather it is about each group being very clear about its motivations for producing knowledge, including career and organisational imperatives.

Extensive Risk: The invisible elephant

From the science perspective, for example, recent and impressive advances in big science climate modelling have influenced the direction of knowledge generation for disaster risk management. This is

encapsulated with the Intergovernmental Panel on Climate Change Special report on Extreme Events. This is a landmark report in collaboration – and communication – between disaster risk reduction, disaster risk management and climate change science and adaptation communities. An exceptional example of co-producing knowledge across academic communities. For the climate change community this lays out the contours of disaster events as a lens onto climate change, and opens up the considerable practical and analytical knowledge on risk management for adaptation scholarship and policy making. For disaster studies this collaboration has raised international profile and relevance of research and practice. This is very positive. There is though a note of caution. From the perspective of disaster risk management, close association with climate science has acted as a kind of reactionary movement. Just at a time when the ISDR Global Assessment Reviews (2009, 2011 and 2013) emphasise the importance of everyday disasters and extensive risk – SREX draws attention to the power of large scale climate modelling and catastrophic risk. Both are important elements of the science and policy space for resilience. But, it is argued the drift towards big science, and big solutions is in danger of leaving behind, potentially the majority, of those impacted by disaster. Those being affected – made homeless, having livelihoods disrupted and health corroded – by very frequent, low intensity events. These events can not easily be captured by big science, nor effectively mitigated by big policy.

There is a real danger of a growing disconnect between the empirical reality of natural hazard exposed populations and the ways in which this is represented by science and so imagined by policy makers.

This concern demands two questions be asked of knowledge production. **(**1) What are the barriers to integration of local knowledge within policy and science? and (2) What can be done to make knowledge more transferable between science, policy and those at risk? The following sections provide road maps for approaching these questions.

What are the barriers to integration of local knowledge within policy and science?

Priority barriers are identified below, these are organised into structural, strategic and methodological concerns. Structural concerns are those which reflect on the wider political-economy of knowledge generation, these maybe somewhat intractable at the general scale, but nonetheless could be challenged at the project level. Strategic concerns identify challenges in the ways in which knowledge generation if framed and the institutional architecture that shapes knowledge flow and impact to action, also widespread concerns but arguably more amenable and core motivations for project design. Methodological concerns are those which can squarely be addressed. They may be difficult to resolve and require concerted effort to shift accepted research and policy practice but lie in the gift of everyday project management.

Structural Concerns:

1. **Big science overwhelmingly attracts support from national research councils** to the detriment of research supporting the framing and collection of local knowledge to resolve local risk management and development challenges. This is a preference for concentrated over distributed research funding. Although, more strategically focussed programmatic funding could support local diversity in knowledge generation under the umbrella of coherent, large scale scientific endeavour. This also flags the need for investment in citizen science – science that can be locally determined and resolve local information questions. Finally a call for better connection between each of these three areas of science.

2. **Difficulty in bringing together natural/physical and social/behavioural science approaches**. This is despite a decade of rhetoric on the value of interdisciplinarity and a current cal for transdisciplinarity where multiple scientific perspectives converge with practitioner viewpoints. The discourse is in the right place but research support is yet to move in this direction with sufficient enthusiasm to produce the step-changing research and policy communication required to address this challenge.

3. **Risk information may be produced but is not always accessible to those who need it.** This requires efforts that can connect the generation of knowledge to processes that build trust. It may be this can be achieved through more emphasis on the co-design of research and coproduction of knowledge which is useful, useable and used. This has implications for who sets the agenda for knowledge production and how knowledge generated by science is valued.

4. **Enabling communities and individuals at risk to act on risk information**. This requires a better understanding of risk perceptions and underlying processes, of the different rationalities and decisionmaking behaviour that shape the ways in which risk management and underlying development problems are framed and consequently the type of information that is prioritised. Lastly this also talks to the social mechanisms that communicate local or policy information needs to research communities

Strategic Concerns:

1. **Governance of risk and knowledge**. There is insufficient accountability to research users amongst those who produce new information and knowledge. This is an expression of a wider lack of focus on the institutional context within which information needs are constructed and data and other information produced. Again, there is a perceived bias towards framing knowledge production for risk management around priorities perceived at the international, regional and national scales, rather than the local. The ICSU Future Earth initiative offers some purchase here.

2. **There is insufficient space for sharing emerging learning about how best to bring together different knowledge sources**. This is a gap at all scales. Local actors require common space to articulate needs and share local science gains; internationally the science community and practitioner groups producing new information need a vehicle for faster and more informed learning on methodologies for shared learning – for bringing together local/citizen and formalised/academic science. There is a role here for RIA and IRDR to provide an institutional architect and champion at the international level.

3. **There is insufficient knowledge on the ways in which local knowledge can better support wellbeing**. This is a concern for better tracking the impact of knowledge on livelihoods, perhaps especially amongst resource dependent communities where better communication of variability in weather and climate could make a considerable and verifiable impact. But this concern also extends to the urban where impacts may be felt most clearly in public health and physical infrastructure burdens. The routine building of research on the impact of science into scientific and policy programming would provide s valuable feedback into research and policy design.

Methodological Concerns:

1. **A need to move from information production to learning**. This shift directly realigns the relationship between knowledge production and impact form passive to active. Such a move is integral to better empowering the users of information and so adjusting the kinds of data and knowledge produced through science, of all kinds. This also places responsibility for outcomes not only on knowledge producers but also on learners. This includes legal responsibility when disaster events unfold despite the best scientific and local knowledge.

2. **A need for multi-risk analysis**. This goes beyond multi-hazard risk assessment to better understand decisionmaking processes for those at risk and living with vulnerable livelihoods. People at risk rarely make decisions about a single hazard. More often decisions are made with partial knowledge and are driven by many factors where risk from economic and social or cultural change needs to be considered alongside natural hazards.

3. **A lack of clarity on shared science metrics**. While citizen science and local control of knowledge production are essential to meet the local determinants of extensive risk, there is also a need to develop a common framework of indicators and metrics. This is needed to enable communication and learning between cases and to develop a scalable knowledge base with which to talk with 'big science' and 'big policy'.

These concerns are aligned with some movement in the international landscape for research funding which, though tentative, is increasingly in support of programme funding that can allow coordinated but distributed research. It also supports a strategic revision of research impact agendas, one that can better encourage co-design and co-production, rather than seeing impact as an end point of research. Finally these comments are a call for the alternative constitution of research consortia, including models that can persist over time and between individual research grants to allow consistent and joined up learning between those at risk, policy communities and researchers. This suggests that research councils alone may not be the best placed supporters of research for knowledge generation to resolve extensive risk. However, going outside the academy has career costs for academics and opens research to the equally shifting winds of NGO or development agency support. A longer term vision is to support the building of lasting and direct relationships between science and those at risk, so that the identities of those who undertake research and knowledge provision and use become blurred. A true citizen's science for disaster risk reduction.

What can be done to make knowledge more transferable between science, policy and those at risk?

There is already a good deal of experience from humanitarian practice and disaster reconstruction on novel ways of integrating science communication into disaster risk reduction programming. Key lessons learnt include:

Using trusted local institutions for risk communication, even when new roles are required. Following the Christchurch earthquake in New Zealand 'knowledge brokers' helped to establish dialogues between those affected and reconstruction planners as part of a Health Advisory Campaign. This included research partners from within the affected communities. Local citizens collaborated as researchers in producing and recording narrative accounts of the event and its aftermath. This helped to build trust with the science team and also to allow local citizens to retain a sense of control over the reconstruction project through active partnership and dialogue with science production.

Impactful science communication is built on an awareness of local values and context. Knowledge brokers helped local community actors to think critically about past development as well as aspirations for recovery and future development paths. Elsewhere, communicating science locally is helped by the use of professional advocacy tools have allowed knowledge to be de-personalised so that knowledge is objectified as scientific not base on personal reputation. In urban communities it is likely that clear scientific language may be the most appropriate language for communication; where there is distrust of external influence science messages may need to be translated into local worldviews before a dialogue can begin. It is not unusual for farmers to distrust information associated with local or national weather stations and meteorological offices, or for information to be presented at scales or time-frames that reduce its relevance. In such circumstances scientific information needs to reinvent itself, based on the needs of local communities and communicated in the worldview of local custom.

Science actors need to understand how decisions are made locally so that new information can be effectively targeted. This ranges from customary, collective decisionmaking for example amongst farmers in arid sub-Saharan Africa, where new information is received alongside other local knowledge; to Facebook discussion sites. In the same community contrasting worldviews can coexist requiring flexibility in communication and integrity of messaging. Flood risk assessments in Afghanistan were framed as local drainage failures by elder citizens and as a product of competing land-use interests from upstream villages by younger citizens. Both were correct, neither complete.

Building on local capacity to facilitate local reflexivity and learning can include peer to peer knowledge transfer. This can be done by identifying champions within communities and forming partnerships between practitioners and local communities. This involves respect for communities to sit at the same table and may be supported by a shift from project focus to more strategic focus in funding regimes to allow longer-term relationships to be built. There is need to create demand for science in the local community. This might involve local communities expressing their needs for knowledge and defining their own questions for science to address. Without this, a top-down approach will continue to be a barrier to partnerships.

Be honest in communicating what science does not know. Work with agricultural communities suggests where uncertainties in the methodologies or data behind climate and weather forecasts are made as clear as possible this can be incorporated in decisonmaking. Part of communicating uncertainty is a recognition that not all scientists speak with one voice and that the language used in science may not be effective in communicating messages to the local communities – what scientists view as important may not be the same as the information or decisionmaking needs of local actors. Certainly there is a strong case for communicating using less text and more graphic representation of information through pictures and drawings. It seems likely that information technology and mass social media communication tools will open huge opportunities for bespoke communication formats and tools as well as targeted messages.

Conclusion

Capacity building is required for researchers and scientists seeking to engage or partner with local communities. Underpinning this is a need to develop field guidelines and share existing lessons on knowledge exchange. This is a core component of a paradigm shift involving breaking down the distinction between the process of knowledge production and policymaking/implementation.

Bringing beneficiaries into research design and impact measurement is an important step in blurring the citizen-science boundary. This can also help in supporting local actors to themselves define information needs. Arguably this is the most fundamental step in reconfiguring science-citizen relationships – the production of a demand led, locally owned science agenda, developed in collaboration with science actors but in the service of local needs. This is not to over romanticise the local, as described above multiple worldviews coexist locally, a focus on the local must not lose sight of social structures that determine vulnerability and risk. The call is not for naive localism but for strong local partnerships to hone science to the service of the vulnerable to the point that local actors own science and are co-producers of science.

The argument for local partnership in the production and communication of risk information is now becoming widespread amongst the humanitarian and practice-oriented academic community. Two important next steps are to (1) provide an international architecture to document experience, and (2) develop programmes to build capacity amongst academic, local and policy actors for integrated science approaches to extensive risk.

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Maria Veronica Bastias, Nguza Siyambango, Gert van Rooy and Terry Gibson, GNDR, Local learning and obstacles to action: case studies and reflection; **Ann Bostrom, University of Washington,** U.S. Risk interpretation and action funding: trends, strategies and opportunities; **Christopher G. Burton, Global Earthquake Model,** The development of measures of community resilience to natural hazards and disasters; **Terry Cannon, Institute of Development Studies, University of Sussex,** Myths and sense in dealing with disasters and climate change; **Richard Ewbank, Christian Aid**, Making climate services useful for rural development: opportunities and challenges; **Charlie McLaren, UKCDS** UKCDS' role as a knowledge broker; **Colin McQuistan, Practical Action,** Community early warning systems in Nepal: turning good ideas into practice; **Britt-Marie Drottz Sjöberg, Norwegian University of Science and Technology,** The power and detriments of non-communication; **Perko Tanja, Belgian Nuclear Research Centre SCK·CEN** Salience of the Fukushima accident on the public agenda: media content analysis; **Emma Visman, Humanitarian Futures Programme NERC Knowledge Exchange Fellow**, Creating channels for exchanging knowledge for the wide range of knowledge sources required to support resilience building.

Full papers and a list of participants can be downloaded from Humanitarian Futures:
http://www.humanitarianfutures.org/content/risk-interpretation-and-action-workshop-may-2013

For further discussion and events on risk interpretation and action, and to join our virtual community of practice please visit the Integrated Research on Disaster Risk – Risk Interpretation and Action Project website: http://www.irdrinternational.org/risk-interpretation-and-action/

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