Strategies for Reducing Disaster Risks – some lessons learned from Africa

Coleen Vogel
REVAMP, University Witwatersrand
Johannesburg
Coleen.vogel@wits.ac.za

Introduction

Africa's vulnerability to climate variability and climate change (CC) is generally acknowledged by natural resource managers, farmers, scientists and policy makers and increasingly civic society (Boko *et al*., 2007). A suite of multiple 'driving' factors and contexts (e.g. multiple stresses, Leichenko and O'Brien, 2008) including poverty, complex governance institutional dimensions, limited access to capital (including markets and human capital), infrastructure and technology, ecosystem degradation and complex disasters can further either compound or ameliorate climate change risks. Many of these stresses, some suggest, also weaken Africa's adaptive capacity to both climate change and climate variability (Boko *et al*., 2007).

Climate-related disasters are also well known in Africa including slow-onset (e.g. droughts) and fast-onset disasters (e.g. floods). Incremental and insidious changes in climate and resultant impacts, are, however, also examples of impending disaster-type events and processes that require attention. Drought episodes, for example, have occurred in the SSA region in 1965-66; 1972-74; early 1908s, 1990s and 2000s (Commission of the African Union *et al*., 2008) impacting on biodiversity and local livelihoods. Other extreme potential disasters include wind and dust storms and locust invasions (Commission of the African Union *et al*., 2008), although these currently often do not receive the same media and arguably scientific attention. Estimated costs from droughts and floods can be large (e.g. 8-9% GDP Zimbabwe and Zambia); 2000 floods lowered GDP to 1.5 % Mozambique (growth averaged 7.5% during 1994-2003) (for more details see Commission of the African Union, *et al*., 2008). Some more detailed and comprehensive inventories of costs, particularly flood-loss estimations including infrastructural-loss estimations are also emerging (e.g. DiMP, UCT). These disaster loss inventories are not, however, only linked to the role of climate triggers and many are the outcomes of 'complex' extremes and disasters that still require more detailed investigation both for current extreme events and future projected costs.

The search for effective frameworks that assist in drawing together knowledge generated on hazards and knowledge on vulnerabilities is on going (see for example the Hyogo Framework that sets out strategies for reducing risks through five key areas e.g. ensuring that risk reduction is a local and national priority with strong institutional support; assess and monitor risks and enhance EWS; use knowledge and education to build a culture of resilience at all levels; reduce the underlying risks etc). In the Bali Action Plan calls for effective risk reduction to advance

adaptation to climate change is also raised with calls for and including risk assessments; EWS; and sector-specific plans (Informal Task Force, Inter-agency standing committee, 2008).

Exposures and responses to climate risks, using a strong risk approach (Yohe, 2008), is also growing. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (Christensen, *et al*., 2007), for example, concluded that Africa is very likely to experience greater warming in all seasons during this century than the expected global, annual mean warming. Annual rainfall is also likely to decrease over much of the continent with projections for increased rainfall in the eastern parts of the continent and likely decreases in winter rainfall along western margins (Christensen, *et al*., 2007). A general increase in the intensity of high-rainfall events is expected in Africa. In regions of mean drying, there is generally a proportionally larger decrease in the number of rain days. For tropical cyclones affecting the south east coast of Africa and, notwithstanding the lack of modelling guidance, there are thermodynamic arguments for increases in precipitation rates and intensity of tropical storms (Christensen, *et al*., 2007).

In this brief paper some of the various lessons and challenges emerging from this complex theme of disaster risk reduction and climate change, using African examples, are discussed focussing on whether these then indeed merit special IPCC-type efforts, together with partners to begin to synthesise and raise up issues for the policy community. Attention will be given to those areas where there is evidence in parts of Africa for progress emerging from both communities including elements of the Hyogo Framework and the Bali Action Plan. A few examples suffice here, namely the role of climate information in EWS and the links between development and climate change and variability.

Extreme events in Africa – the role of effective information

As in other disaster prone areas of the world, disasters linked to climate include a number of events such as droughts and floods. Whether these ‘extreme events’ often resulting in disasters, are linked more strongly to anthropogenic climate change versus or linked to climate variability clearly still requires further investigation (see for example differing inputs related to hurricanes, Emmanuel et al., 2008; Kerr, 2008).

The links between El Nino and La Nino events, for example, often resulting in severe flooding or droughts, require more detailed interrogation. Have El Nino events become more frequent than La Nina events and what are the links of such patterns to climate change, if any? Are there discernable changes in the timing and magnitude of hazards such as floods and droughts that we can begin to say something meaningful to disaster risk practitioners? In southern Africa, for example, much research has been undertaken on the El Nino Southern Oscillation, ENSO and rainfall variability. Past experience, while showing linkages in some cases (e.g. early 1980s drought events in parts of southern Africa) also shows that the relationship between ENSO and summer rainfall in certain areas (e.g. South Africa) may not always hold (see for example papers by Landman and Mason, 1999 and Reason *et al*., 2006). Over reliance on only one indicator (e.g. ENSO) for effective disaster risk reduction is therefore problematic. Notwithstanding these cautionary remarks, the 1997/98 still is known as one in which the humanitarian community managed to act on some indicators and Early Warning signals and large amounts of food and other sources of relief were mobilised to those areas that did require urgent assistance.

A concern, however, from such debates is the growing practice of several folks currently trying to draw very strong ***connections between an extreme flood event, for example, and climate change, despite the current lack of certainty in these model associations***. This, perhaps more than any other, would be good reason to initiate a special report on disaster events and climate change, if not least to clarify the state of the science to date and assist in guidance for future adaptation policies and practices.

The challenge of strategies designed to work in the development and climate change interface

Teasing out strategies designed specifically for risk reduction to climate induced or climate 'triggered' disasters is also a rather 'grey' area. The reasons for the ambiguity include trying to ***identify the role that climate change and or variability indeed plays amongst the suite of other stresses in shaping a disaster***. One thus often finds a mixture of strategies or calls for an integrative framework for risk management and climate proofing of development (Sperling and Szekely, 2005; see also elements of the Hyogo Framework). What are the possible linkages between finding ways to deal with *short falls in development* that are often only *'unveiled' during a climatically triggered disaster event*? Likewise, how can one best address the required risk reduction efforts strongly demarcated, and that usually materialise, during extreme climate events (Provention Consortium Forum, 2007; examples from DiMP, UCT)?

Adaptation to climate change in disaster risk management for the Buzi watershed in Mozambique has shown the need for including both adaptation measures such as improved EWS and national plans to reduce poverty:

> "Several regions in Mozambique are *already experiencing intensified hurricanes and the disasters* ***that seem*** *to follow the changing climate*. Because of this, the Government of Mozambique decided to actively include disaster risk management in the national plan of action to reduce extreme poverty" (Liptow, GTZ as cited in Sperling and Szekeley, 2005, 23, emphasis added).

How does one prioritise such efforts, in a challenged fiscal and human capacity environment? Does one channel more efforts into climate monitoring and Early Warning efforts, and to the suite of climate related activities or does one focus on better development and planning efforts? Or, as some of the emerging literature suggests, mainstream climate adaptation efforts into development planning and other strategies (e.g. environmental impact assessment)? If the planning route is chosen, however, this then raises a range of challenges, not least in deciding how one assigns international and local adaptation funding, prioritising capacity required and other efforts for effectively living with and reducing disaster risks. Clarity on this 'discourse' would be most helpful to policy makers who are faced with prioritising efforts, particularly in Africa (e.g. often competing financial and political challenges of HIV/AIDS, education, infrastructural development and/or establishing climate change efforts and institutional capacity).

Given this background, the remaining part of the paper addresses some of the emerging strategies that appear to be enabling enhanced risk reduction to extreme events drawing on the range of efforts including those by the World Bank, the UNISDR, WMO amongst others. There are several case studies showing the linkages and benefits of linking disaster risk reduction

efforts to better climate change adaptation (e.g. Sperling and Szekely, 2005). Included in the challenges emerging from several of these efforts are those linked to poverty reduction; education; information (including collection, dissemination and implementation and EWS) and enhanced decision making; the types of institutions and 'institutional designs or architectures that future risk reduction may require and financing frameworks including international, national and others e.g. insurance; and, finally, mainstreaming and sectoral co-ordination at various scales including national to local levels (see for example, Brewer and Stern, 2005; Sperling and Szekely, 2005; Provention Consortium Forum, 2007; Commission of the African Union. ISDR, World Bank, 2008). Some examples of strategies for some of these will be provided including a brief reflection of some the barriers, constraints and opportunities that have emerged.

Some suggested ways forward

Finally, some reflection on the need and development of processes to better understand and possibly co-ordinate outcomes from the various DRR and CCA (climate change adaptation) and CBRM (community based disaster risk management and CBA (community based climate change adaptation efforts) will be made that may provide a repository of cases that can then assist both the emerging scientific and policy community in better understanding the challenges for reducing risks to climate change and variability.

Selected references

Boko, M., I. Niang, A. Nyong, C. Vogel, A. Githeko, M. Medany, B. Osman-Elasha, R. Tabo and P. Yanda, 2007: Africa. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.* M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, eds., Cambridge University Press, Cambridge UK, 433-467.

Berger, R. and Ali, M., 2008: Adaptation in South Asia, *Tiempo*, 68, 22-24, article contains some useful notions of scaling up 'bottom-up' community efforts to improve adaptation efforts.

Brewer, G.D. and Stern, P.C., editors, 2005: *Decision making for the environment: social and Behavioural Science Research Priorities*, Committee on the Human Dimensions of Global Change, National Research Council.

Christensen, J.H., B. Hewitson, A. Busuioc, A. Chen, X. Gao, I. Held, R. Jones, R.K. Kolli, W.-T. Kwon, R. Laprise, V. Magaña Rueda, L. Mearns, C.G. Menéndez, J. Räisänen, A. Rinke, A. Sarr and P. Whetton, 2007: Regional Climate Projections. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 852-871.

Commission of the African Union; United Nations International Strategy for Disaster Risk Reduction; The World Bank, 2008: *Report on the Status of Disaster Risk Reduction in the Sub-Saharan African Region*, January, 2008).

Emmanuel, K., Sundararajan, R. and Williams, J., 2008: Hurricanes and global warming, results from downscaling IPCC AR4 simulations, *Bulletin of American Meteorological Society*, 89, 347-367.

Kerr, R.A., 2008: Hurricanes won't go wild, according to climate models, Science, 320, 999.

Kituyi, E., 2006: Institutions for adaptation, *Tiempo*, 61, 16-19.

Landman, W.A. and Mason, S.J., 1999: Change in the association between Indian Ocean sea-surface temperatures and rainfall over South Africa and Namibia, *International Journal Climatology*, 19, 1477-1492.

Leichenko, R.M. and K.L. O'Brien, 2008: *Environmental Change and Globalization, Double Exposures*, Oxford University Press, New York.

Provention Consortium Forum, 2007: Making disaster risk reduction work, Dar Es Salaam, Feb 13th-15th, 2007.

Reason, J.C., Landman, W., Tenant, W., 2006: Seasonal to decadal prediction of southern African climate and its links with variability in the Atlantic Ocean, *Bulletin of the American Meteorological Society*, 87, 7, 941-955.

Sperling, F. and Szeleky, F., 2005: *Disaster Risk Management in a Changing Climate*, Discussion paper prepared for the World Conference on Disaster Reduction on behalf of the Vulnerability and Adaptation Resource Group VARG.

Yohe, G., 2008: A reason for optimism, a change in attitude towards climate risk in the IPCC. *Tiempo*, 24-25.