

Expert Meeting
on
Climate Change and Disaster Risk Management
FAO Headquarters, Rome, 28-29 February 2008

Options for Decision Makers

Introduction

Climate variability will result in more frequent and extensive disasters – with the most severe consequences on the food security and livelihoods of agriculture-dependent populations in vulnerable countries. Changing climate patterns have increased the urgency to invest in disaster risk reduction, preparedness and management activities, above and beyond other efforts directed toward climate mitigation and adaptation.

The UN ISDR defines disaster risk management as “the systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all forms of activity, including structural and non-structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards”. In the context of climate change, disaster risk management refers to systematic processes to lessen the impacts of climate-related hazards.

The expert meeting considered the cross-sectoral linkages of climate change, disaster risk reduction and management, with a particular focus on the implications for agriculture and food security. The scope of the expert meeting concentrated on those aspects of climate change related to increasing frequency and intensity of extreme climate events such as droughts, floods, windstorms and wild fires. The meeting did not address projected longer term impacts of gradual climate changes such as glacier melt, sea level rise and ecosystem stress.

Context

Climate-related disasters are increasing. The number of reported disasters related to hydro-meteorological hazards (e.g. droughts, floods, wind storms, forest fires, landslides) significantly increased from 1987 to 2006 – from an average of 195 per year from 1987 to 1998 to an average of 365 per year from 2000 to 2006. Such a dramatic increase in the number of reported disasters is *also* related to improvements in reporting of smaller scale disasters¹. Of the more than 230 million people affected annually by disasters between 2000 and 2007, about 98 percent were due to weather and climate-related hazards, predominantly floods and windstorms, followed by droughts².

¹ Center for Research on the Epidemiology of Disasters (CRED)/ISDR, *Annual Statistical Review: Numbers and Trends, 2006*, Brussels 2007.

² *CRED Crunch*, Issue No 12, April 2008.

According to the IPCC, climate change is altering disaster risk patterns in three primary ways:

- increase in frequency and intensity of extreme events, such as more frequent extreme temperatures and heavy precipitation, more intense tropical cyclones and expanded areas affected by drought and floods³;
- changes in geographical distribution of areas affected by hazards; and
- increase in vulnerability of particular social groups and economic sectors due to sea level rise, ecosystem stress and glacier melt.

Hazardous events do not in themselves determine disasters; disasters also depend on human vulnerability. Human vulnerability is determined by physical, social, economic and environmental factors or processes, such as precarious settlements, dependence on fragile ecosystems, unsafe buildings and uncertain livelihood options. Disaster hotspots are characterized by exposure to recurrent hazards in combination with high numbers of people living in vulnerable conditions. Negative impacts on food and livelihood security are characterized by more than increases of hazardous climate events. They are affected by cumulative effects of multiple shocks, such as climate, market and health, in combination with governance issues, socio-economic factors and environmental degradation. Mortality risk due to climatic hazards is highly correlated to low levels of human development and large rural populations, indicating that economic and social development is a key element of risk reduction. The poorest developing countries are particularly at risk because of their geographic exposure, low incomes and greater reliance on climate-sensitive sectors, particularly agriculture. Of the 262 million people affected annually by climate disasters between 2000 and 2004, more than 98 percent lived in developing countries, the vast majority dependent mainly on agriculture and fisheries for their livelihoods. In OECD countries, one person in 1 500 was affected by a climate-related disaster while the figure for developing countries was one in 19⁴.

Although hazards are increasing, capacities to cope with disaster risk have improved. Disaster occurrence in the past 30 years has increased much faster than the numbers of deaths, which have remained relatively constant⁵. Thus, pro-active strategies are essential if vulnerable countries are to avoid large-scale loss of life and destruction of the environment and infrastructure, as well as deterioration of food security, livelihoods and nutrition.

Developing the knowledge basis

The potential linkages between evolving disaster risk patterns and the likely impacts of climate change are complex, non-linear and only partially explored. The instruments available to explain global trends and advocate for global action are not detailed enough to inform national planning and policy-making. Thus, to improve understanding of local and national risk profiles and advance risk reduction and response planning, it is necessary to combine downscaled climate models that focus on projected changes with local-level vulnerability assessments that focus on current threats. Only such integrated assessments will allow for improved understanding of who is vulnerable and how vulnerability patterns will change over time. Analysis needs to be conducted through the use of disaggregated data that differentiates

³ By 2020, between 75 and 250 million people are projected to suffer increased water stress in sub-Saharan Africa. More than 20 percent of the world population live in river basins expected to be affected by floods by 2080.

⁴ UNDP, *Human Development Report 2007/2008*.

⁵ UN, *Disaster Risk Reduction Global Review 2007*.

levels of vulnerability according to age, gender, social and poverty groups, ethnicity and other socio-economic factors that influence people's resilience.

Climate change is occurring in parallel with rapid changes in global economy, communications and social support structures that generate additional threats but also opportunities for climate risk reduction and response. To date, the focus has been mainly on analysing the impacts on food production. However, more focused attention on the complex interactions of these factors is necessary to understand the present and longer term impacts on livelihoods and food access, stability and use. A number of tools have been developed within the humanitarian community to measure (quantitatively and qualitatively) the impact of disasters on food security and livelihoods. Baseline livelihoods profiling and analysis, and food security assessments in areas at high risk are useful to increase understanding of post-disaster needs, measure progress in adaptation and risk reduction, and ensure that development programming considers the needs of the most vulnerable groups. This should be combined with improvements in statistical disaster data collection and analysis at country level. In fact accurate disaster data relating to mortality is available at the national and international levels. Although improving, data on economic losses remains limited and often unreliable. Local-level losses and impacts on livelihoods, particularly of the smaller scale recurrent hazards, are systematically under reported.

Adverse impacts of future climate change mostly will be an intensification of current hazards in places where they already occur as well as extension to new areas. As most countries and communities have adapted to climate variability over centuries, capacities developed to cope with existing climate threats can be used for adapting to future threats. There is a need to learn more about current coping strategies including how to improve them in the face of more frequent and intense shocks. This is important to ensure that development programmes and aid support, rather than undermine, positive local resilience strategies of the vulnerable. For example, it is important to know what happens when pastoralists migrate to urban areas during times of extreme drought. Do they stabilize in urban areas, do they migrate abroad, do they diversify into other agricultural activities, move into business, invest in education? There is also a need for science-based research to address current threats, such as improvements in long-lead forecasting, development of resistant crop varieties, and water conservation technologies.

Climate change and disaster risk management are closely linked

Disaster risk management and climate change adaptation are ultimately about reducing the risk posed by climate change to the lives and livelihoods of vulnerable people and therefore are key tools for protection of food security.

There are two major linkages between climate change and disaster risk management:

- climate change will increase the number and scale of disasters that need to be managed and modify local vulnerability to shocks; and
- existing institutional structures, technologies and tools to manage disaster risk are natural entry points for reducing losses to current threats and thereby would enable longer term adaptation.

At the same time, with regard to reducing vulnerability to climate risks, two distinct communities of practice have evolved: those focusing mainly on longer term global climate change research and modelling; and those focusing on national and local-level management of hazards and disasters. Disconnection between these two communities, in terms of their

distinct conceptual and institutional frameworks and funding approaches, has often resulted in local-level failure to reduce vulnerability. Increasing efforts to bring the two communities together are, to a great extent, informed by the principle of addressing vulnerability to existing shocks while developing sufficient flexibility to adjust to uncertain future scenarios (i.e. tackling gradual changes as well as new hazards).

Climate change and disaster risk management need to be integrated into development planning and humanitarian assistance

Climate-related disasters can reverse development gains by undermining livelihood and food security, damaging infrastructure, increasing exposure to disease and eroding ecosystems. At the same time, unsustainable development augments climate risk through increasing greenhouse gas emissions and exacerbating physical and socio-economic factors of vulnerability such as unregulated urbanization, natural resource degradation and unequal access to information. There is general agreement that disaster risk management and climate change should be embedded in development and relief planning to avoid increasing risk through inappropriate development and to ensure the structural factors of vulnerability are systematically addressed.

This said, no matter how much is invested in risk reduction, poor and marginalized people with limited assets will fall back on humanitarian assistance, increasing the demand for national and international emergency response. Climate change will have major implications for humanitarian approaches, the logistical problems of managing an increasing number of smaller scale disasters and “mega-disasters” simultaneously, and financing. Finance, in particular, needs flexibility to allow for support to local and national emergency systems, investment in preparedness and enhanced linkages with development activities.

Implications for mainstreaming at different levels

Local level

Local institutions are the backbone of disaster risk management and will be the primary interface for community-level efforts in adaptation to climate change, as risk reduction and response occur primarily at the local level. More than 80 percent of disasters are managed through local and national institutions. Practically all immediate life-saving actions and initial emergency support in the first few days after the 2004 Indian Ocean earthquake and tsunami (and weeks in some cases) were provided by local people, often assisted by national institutions. However, capacities to absorb new skills and technology are limited and local institutions tend to suffer from additional mainstreaming demands driven by donors. Support to improve understanding and management of climate risk needs to be channelled through: existing formal and informal institutions such as places of worship, extension services and health points; and programmes such as food security, water and sanitation, and rural development. These support efforts also need to recognize that communities normally address climate risk through a multi-hazard perspective focusing on immediate threats. Potentially, extension services can play a key role in delivering advisory services for climate risk reduction but this will require enhanced collaboration with national research institutes and regional and international organizations and training of staff. Most disaster risk management functions benefit from devolution of responsibilities (following the principle of subsidiarity), ideally combining both “top-down” and “bottom-up” approaches.

National level

Consideration of evolving climate risks, particularly their likely impacts on agriculture, fisheries, forestry and food security issues, requires enhanced collaboration that brings together:

- disaster risk management institutions: normally housed within the ministries of interior or civil protection, with strong linkages to the international humanitarian community;
- climate change focal points: normally housed in the ministries of environment or meteorological services with strong linkages to national and international research institutes;
- food security focal points and advocacy groups: to ensure that food security and livelihoods protection are addressed in climate adaptation and risk management strategies;
- resource management agencies (departments of agriculture, livestock, fisheries, forestry, land , water): to integrate climate change and disaster risk management into resource management planning;
- research institute: for modelling, forecasting, crop research and technology development.

Having this broad-based collaboration in place will serve to ensure:

- agriculture, environment and food security departments are represented in national, provincial and local disaster risk management committees;
- risk reduction and climate change adaptation focal points or teams are appointed and trained within food security, agriculture, fishery and forestry line departments;
- cross-sectoral or multi-stakeholder platforms are established to identify risk reduction and climate- change adaptation priorities and ensure involvement of research institutions, civil society and the private sector;
- sector-specific (multi-hazard) risk reduction strategies, such as national strategies for risk reduction in the agriculture sector, or cross-sectoral hazard management plans, such as national and local drought management plan, are developed and implemented; and
- vulnerability assessments are integrated in Poverty Reduction Strategies and national and local development plans.

Regional and international levels

Climate hazards affect communities across national borders. For example, flood management in Mozambique relies heavily on the watershed management practices of upstream bordering countries; traditional drought coping strategies in the Sahel are being hampered by restrictions on cross-border migration. Regional cooperation frameworks are essential to manage transboundary issues. Such frameworks are becoming key instruments for enhancing national preparedness and contingency-planning capacities.

At national and international levels, the UN ISDR Hyogo Framework of Action (2005-2015) provides a valuable framework to set priorities for action. It serves as a platform to operationalize linkages among disaster risk management, climate change and development. Post-Kyoto negotiations should allow for stronger emphasis on food security and livelihoods

protection in the context of climate change adaptation, including mechanisms to support and fund local-level adaptation with additional resources mobilized in recognition of industrialized countries responsibilities.

Climate risk management also should be integrated into international agencies' strategic plans and become a theme for enhanced UN agency collaboration, particularly through the UN Development Assistance Framework (UNDAF) processes. FAO should be encouraged to assume a more proactive role in facilitating collaboration among the Rome-based UN agencies on issues relating to the agriculture and food sectors and to enhance linkages among research, policy-making and local-level institutions for climate risk management.

Relevant information on climate risk often has been unavailable, inaccessible, not usable or not understandable by end users. More emphasis on networks – consisting of national line departments, research institutes, civil society and regional and international organizations – is needed at all levels for raising awareness, sharing information and communication.

Priorities for action

Systematic national and local risk assessment combining downscaled climate models that focus on projected changes with local-level vulnerability assessments that focus on current threats, particularly to coastal, riverine and drought-prone areas in order to increase understanding of climate impacts on food security, access to natural resources, agriculture, fisheries and forestry. This will require:

- reviewing climate risk information available at national level;
- determining capacities for data collection and use; and
- undertaking country-wide risk profiling with a focus on vulnerable areas, sectors and groups.

Integration of risk mitigation and climate change adaptation in climate-sensitive sectors through:

- adapting agriculture, fisheries and forestry practices through, for example, adjustment of crop and fishing calendars, and introduction of climate-resilient crop and tree varieties;
- climate proofing of post-harvest management practices such as storage, drying and processing;
- improving fishing craft design and enhancing safety at sea through training and equipment;
- improving sustainable natural resource management to increase resilience of food production systems⁶;
- increasing afforestation and agroforestry;
- investing in infrastructure and hazard proofing critical facilities⁷;

⁶ Sustainable natural resource management strategies (soil, land, water, fishery, forestry, etc.) are a prerequisite for risk reduction climate adaptation. Inappropriate ecosystem management practices increase vulnerability to climate change.

⁷ Investment in large-scale infrastructure requires accurate cost/benefit analyses. However, a number of small-scale, relatively low-cost measures can be promoted at local level, such as raised seed beds, wind and fire breaks, and routine drainage canal clearing.

- diversifying livelihoods through decreasing dependence on climate-sensitive farming activities, and increasing small-scale enterprise development and off-farm activities.

Improved use of climate information which requires more investment in networks of climate stations, capacity building for interpreting information, user-friendly forecasting tools and products, linkages between service providers (researchers and hydro-meteorological services) and service users (humanitarian actors and climate-sensitive sectors), and production of impact outlooks for specific audiences.

Enhanced people-centred early warning systems and mechanisms to allow for early alerts to trigger early action taking into consideration issues of trust and differences in access to information because of gender, social status or age and people mobility potential.

Strengthen preparedness for effective response through:

- expanded contingency planning, especially in areas prone to flood, windstorms or drought, that considers new and evolving risk scenarios and integrates “build back better” principles to induce prevention and adaptation in rehabilitation;
- more flexible funding mechanisms at the international level that allow development and humanitarian resources to be invested in preparedness;
- preparedness for diversified livelihoods response options combined with social protection measures (household, national and international level).

Increase resources considering the high profile of the current debate on climate change as an opportunity to increase political commitment and resource allocation to vulnerability reduction. A number of new and traditional funding instruments can be used to address climate risks and food security consequences. They range from microfinance tools that support ex ante disaster risk management activities at the community and household levels to adaptation funding through UNFCCC processes and new funding windows for least developed countries such as the World Bank Global Facility for Disaster Reduction and Recovery.