



How resilient is your country?

Extreme events are on the rise. Governments must implement national and integrated risk-management strategies, says **Erwann Michel-Kerjan**.

As the United States continues to mop up after Superstorm Sandy, we see again our vulnerability to extreme events. The destruction was massive: US\$50 billion in economic losses; large-scale evacuations; thousands of businesses closed in anticipation; and millions of Americans without power for days. But the catastrophe had a silver lining: the way that science was used to improve decision-making.

Still, much more is required to make nations truly resilient to extreme events — we need to develop national risk-management strategies.

The United States' response to Sandy contrasted vividly with that to Hurricane Katrina. In 2005, the inability to foresee and effectively communicate the possible failure of the levee system in New Orleans, and the incapacity of the government to address the basic needs of those affected, surprised the world.

Katrina caused 1,300 deaths in the United States, many of them avoidable. Many fewer died from Sandy. Comparisons are never perfect, but it is clear that the systematic use of scientific evidence by the government and the media led to more effective crisis management. Information on the most likely path Sandy would take and on conditions at landfall (based on national and international forecasts of wind speed and storm surge) all helped.

A few days after Sandy, I flew from New York to Mexico City to participate in the final round of G20 meetings, which drew the finance ministers and central bankers of 20 major economies. This year, the group formally recognized disaster-risk financing and management as a priority.

This sends an important signal to the international community because Sandy was not an outlier. It could even be the new norm, as continuing development in high-risk areas combines with intense disasters to produce ever-increasing damage.

Worldwide, economic losses from natural catastrophes rose from \$528 billion in 1981–90 to \$1,213 billion during 2001–10. In 2011 alone, they amounted to \$380 billion, in large part because of the earthquake, tsunami and nuclear accident in Japan. The previous year, earthquakes caused massive losses in Haiti, Chile and New Zealand. Large-scale floods have struck Australia, China, Pakistan and Thailand, and in the past decade, a series of hurricanes has generated economic losses of hundreds of billions of dollars in the Americas.

Given this situation, governments should be able to answer, comprehensively and quantitatively, five questions that I see as pillars of national risk management. What risks do we face and where? What assets and populations are exposed and to what degree? How vulnerable are they? What financial burden do these risks place on individuals, businesses and the government budget? How best can we invest to reduce risks and strengthen economic and social resilience?

Many governments do not know the answers.

In a 2011 survey by the Organisation for Economic Co-operation and Development, more than half of the governments that responded could not assess aggregate amounts of insured losses from disasters (this would require merely collecting data from the insurers). Most do not have systematic and publicly available data on total losses, which is necessary to assess disaster vulnerability.

Preparation for disasters — from early warning systems, urban planning and zoning, to mitigation and financial protection — requires detailed estimates for all segments of society, including the economic exposure of the government itself. Yet even the United States has no public national database of residences and buildings in flood-prone areas.

This is particularly frustrating given the tremendous improvement in our capacity to do large-scale probabilistic catastrophe risk assessments; to measure hazards; to assess the vulnerability of buildings, infrastructure and livelihoods; and to calculate the resultant expected losses.

The estimates are still not perfect, but they continue to improve. The insurance industry already uses them to manage trillions of euros of coverage around the world. Done on a national scale, they could form the basis of a coherent and science-based national risk-management strategy. It will not be cheap, but it would be a wise investment.

To do that for all the extreme events that a country can face, and to mitigate and finance them and overcome behavioural barriers, demands multi-disciplinary work and strong coordination, both among scientists and across government ministries. I recommend that governments appoint cabinet-level national-risk officers, similar to

what is done for enterprise-wide risk management in the private sector.

In 2008, the World Bank, with the Swiss Agency for Development and Cooperation, assembled a small group of dedicated experts to undertake such an effort in Morocco. I have been involved since the beginning, and having finished the initial assessment phase, we are now supporting Morocco in developing an integrated national strategy to mitigate the impact of floods, earthquakes, tsunamis, drought, commodity volatility and agriculture risks. I hope that Morocco will provide a concrete case of what can be done. And for us, as scientists, engineers and financiers, it is highly rewarding to know that our work will contribute directly to saving lives and helping millions of families recover from a disaster.

A growing number of heads of states want to make resilience a priority, but are unsure of the first step. Good practice demands a combination of quantitative knowledge and leadership at the top. Shall we start? ■

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