

Mitigating disasters—a promising start

A 10-year UN plan to make the world safer from natural disasters went into effect in 2005. With 2015 nearing, countries are now assessing how well it has worked. John Maurice reports.

For gourmets, Hyogo is a Japanese prefecture known for its marbled beef. But for the world's disaster community, it is where, in 2005, the heads of state of 168 countries agreed on a UN plan to make the world a safer place for humanity. The Hyogo Framework for Action spelled out what all countries in the world had to do over the following 10 years to make disasters less disastrous. The need for action was not in doubt. In the 1980s, about 400–500 disasters were occurring every year, on average. By 2004, just before the Hyogo conference, the number had doubled.

However, it wasn't really the dramatic statistics that convinced delegates at the Hyogo conference to act. Just 3 weeks earlier, a magnitude 9.0 earthquake occurred under the Indian Ocean, generating a tsunami thought to be the most destructive in history. An estimated 220 000 people were killed in 11 countries and millions were left homeless. A pall hung over the Hyogo conference, recalls Margareta Wahlström, special representative of the UN Secretary-General for Disaster Risk Reduction. Ironically, the tragedy was providential for the Hyogo Framework. "If the Indian Ocean tsunami had not happened", she tells *The Lancet*, "the framework would not have had such a strong impact and such high-level acceptance as it has had among the nations of the world. It would never have become such a powerful tool".

Endorsed shortly after the conference by the UN General Assembly, the Hyogo Framework became a voluntary instrument applicable to all 193 nations in the world. It was the culmination of a half a century of international conferences,

treaties, frameworks, and strategies all designed to lessen the death and damage wrought by disasters. The Hyogo Framework broke new

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ground. Previous instruments focused largely on responding to a calamity, on repairing the damage done, and on relieving the suffering of victims rather than on trying to mitigate the impact of a disaster. "The Hyogo Framework shifted the disaster management paradigm from what was largely a reactive focus to what now includes a more proactive approach to prevention", says Mark Keim, associate director for science in the Office of Environmental

Health Emergencies at the Centers for Disease Control and Prevention (CDC), in Atlanta, USA. "Before Hyogo we focused on the hazard—the hurricane or the earthquake—as the cause of a disaster but we know now that the cause of a disaster is not just the hazard but rather how vulnerable the population is."

How vulnerable a population is to the deaths, economic losses, and social upheaval of a disaster will depend, according to the Hyogo philosophy, on the population's resilience: namely, in the words of the framework, "its capacity to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure". The central aim of the Hyogo Framework is to make all countries resilient to disaster. To do so, it calls on every country to make lessening the impact of disasters a local and national priority; to determine just how vulnerable the country is to a disaster and to build or reinforce its early warning systems accordingly; to become well-informed about the

For more on the Hyogo Framework see <http://www.unisdr.org/we/inform/publications/1037>



The Hyogo Framework for Action was endorsed shortly after the 2004 Indian Ocean tsunami

Panel 1: Disasters at a glance

- Water-related hazards, such as floods, and weather-related hazards, such as storms, cyclones, and droughts, account for about 90% of all natural disasters. Geophysical hazards, such as earthquakes, volcano eruptions, and landslides make up the rest.
- Factors likely to increase the frequency of natural hazards include climate change and environmental degradation, and also the growing number of people living in flood-prone river basins (up by 114% since the 1980s) and on coastlines exposed to cyclones (up by 192%).
- Eight of the ten most populous cities in the world are at risk of major earthquakes and six out of ten, to storm surges and tsunamis. With the world's urban population set to rise from 3.6 billion in 2010, to 5.6 billion in 2040, the risk of deadly disasters is likely to increase accordingly.
- Of all deaths caused by disasters over the past two decades, 95% have occurred in developing countries.
- Over the past 50 years, 41% of disasters have occurred in Asia, 26% in the Americas, 14% in Europe and in Africa, and 5% in Oceania. Storms are the commonest cause of disasters in the richer countries, and floods, in the poorer countries. Droughts are twice as common in the poorer as in the richer countries.
- Between 2005 and 2009, more than 50% of people affected by natural disasters lived in areas of conflict.
- In 2011—one of the worst disaster years in history—more than 300 disasters occurred, 106 million people were affected by floods, 60 million by drought, nearly 30 000 were killed, and the world economy suffered losses amounting to more than US\$350 billion.
- Between 1982 and 2012, disasters have affected 4.4 billion people, killed 1.3 million, and caused material losses amounting to \$2 trillion.

potential impact of a disaster and to use that information to create “a culture of safety and resilience” at all levels of society; to act against the factors responsible for the impact of disasters; and to ensure that the country is prepared and able to cope with a disaster.

Virginia Murray, head of Extreme Events and Health Protection at Public Health England sees the framework as “a magnificent achievement and a good start to reducing the risks associated with disasters”. She is particularly impressed with how countries the world over have given it their support. “The Hyogo Framework is bringing together an incredibly diverse community of countries with different development problems and it is making them aware of the benefits of reducing the impact of disasters.”

The 2005 conference that spawned the Hyogo Framework gave it

10 years to improve the resilience of countries in the face of disasters. Certainly, the number of countries buying into the framework's full process has grown, from 90 in 2007, to 139 today. By January, 2013, all 193 countries had enacted legislation aimed at reducing the potential impact of disasters. To date, 45 countries have reported great progress and a further 44, average-to-good progress, in complying with the framework's requirements.

Signing on to the Hyogo process is one thing, but has the framework made the world safer? Disaster statistics are not encouraging. Since the advent of the framework some of the most devastating disasters have occurred and disasters have become more frequent, hovering now at around 1000 a year (panel 1). The reason why is not clear, although climate change is often blamed. Disasters are also becoming more

catastrophic, as population growth makes increasing numbers of people vulnerable to the impact of disasters. Deaths from earthquakes have also surged as cities located in seismic zones have expanded in recent years.

However, as Wahlström notes, the framework was not created to stop disasters occurring—a virtually unattainable target—but rather to reduce their impact. Certainly, deaths from weather-related disasters, which account for at least 90% of all disasters, have declined in recent years. In east Asia and the Pacific, deaths from floods and cyclones have dropped to about a third of what they were in 1980 (panel 2).

“This is an encouraging trend”, Wahlström says, “and I really think it is attributable to the Hyogo Framework. Most countries have, to one extent or another, acted on the framework's recommendations and have begun making improvements in their early warning systems and evacuation procedures. Moreover, countries with large populations and highly exposed to disasters, such as China, Indonesia, Japan, and the Philippines, have made good progress in fulfilling the Hyogo requirements. And don't forget, there was never any deadline set for having everything in place. This has been a period of building the foundations for change, such as the basic institutions needed to manage disasters, and for making the world aware of the need for action. That awareness is now strong.”

The CDC's Mark Keim agrees. “The Hyogo Framework has set us on a path. It'll take the nations of the world time to advance down that path. But already the framework is having an effect. It is asking us to be more focused on adapting to and reducing the growing impact of extreme events rather than just responding every time we get hit by an event. It is making countries think twice about development choices and making them bear

in mind the risks associated with disasters.”

Not everyone, though, is convinced of the usefulness of the Hyogo Framework. Marcus Oxley, Executive Director of the Global Network for Disaster Reduction, believes the framework doesn't reflect the reality of the vast majority of people most affected by disasters. “The framework's main failing is that its scope is largely disasters from natural causes. When you go to places like the Sahel region in West Africa, the Horn of Africa in the east, Afghanistan, and Haiti, you see that disasters are not just due to natural causes but also to violence, insecurity, conflict, state fragility, and a lack of good governance. All these factors feed off one another and make people vulnerable to a disaster.” Oxley also regrets that the media and the international community respond only to major disasters. “It's the small-scale recurrent disasters that are the bread and butter of crises that affect most people, like your street getting flooded, your house being destroyed, the loss of your livestock.”

Wahlström admits that reaching local communities is where the framework has had the least effect. “It's the last leg we have to cover. We won't make rapid progress towards our goal unless we can get the full attention of local communities and local government officials.” To remedy this shortcoming, in 2010 the Geneva-based UN Office for Disaster Risk Reduction (UNISDR) launched a project—Making Cities Resilient—to urge local city authorities to act on the Hyogo message. To date, 1423 cities in 94 countries have signed on to the project.

Health, too, could have been given a bigger role in the Hyogo process, according to some observers. Jonathan Abrahams, who coordinates WHO's work on management of disaster risks, says “health is central to the work being carried out on

Panel 2: Building resilience pays off

Flooding in China killed 3.7 million people in 1931, and 2 million people in 1959. Since then, the country has introduced a wide-scale early warning and evacuation system based on scientific evidence of when and where disasters are most likely to strike. Since taking these measures, flood victims have routinely numbered less than 2000.

In Bangladesh, between 1970 and 1991, two cyclones caused, together, more than 500 000 deaths. Subsequently, the government built three-storied cyclone shelters along the country's south-western coast and set up an early warning system that uses a network of volunteers to warn all coastal communities of an impending disaster. The system was put to the test on Nov 15, 2007, when Cyclone Sidr—said to be the most powerful cyclone to have ravaged the country in over 15 years—struck the southern coast. 3 million people crammed into the shelters. There were 4200 deaths, a vastly reduced toll compared with previous disasters.

In September, 1995, Hurricane Luis, one of the most destructive hurricanes on record, hit the Caribbean island of Saint Martin, of which the northern part is French and the southern part, Dutch. Sint Maarten, in the south, suffered catastrophic damage, with losses amounting to twice its gross domestic product. Saint Martin on the French side suffered far less damage despite being closer to the eye of the storm. Subsequent studies found that buildings on the French side of the island were better designed to withstand earthquakes and hurricanes.

Flooding in 2000 in Mozambique affected more than 4.5 million people, killed more than 700, and left more than 500 000 homeless. Over the following 5 years, the government raised its emergency preparedness level throughout the country, building accommodation centres in flood-prone areas and introducing hydrological monitoring and early warning systems. In 2007, floods in the Zambezi River Basin and a cyclone in two south-eastern provinces in 2007 affected 285 000 people, killing 29 and displacing 165 000.

reducing the risks associated with all types of disasters. I think the framework could be more explicit about the central role of health outcomes for people at risk of disasters”.

For her part, Virginia Murray would like to see a clearer role for evidence-based science and technology in informing policy decisions relating to disasters. “In many countries”, she notes, “science and technology play an essential role in reducing the impact of disasters through the development and use of systems for forecasting floods, detecting tsunami waves, and other early warning methods”.

These suggestions are among the many options that have, in recent months, been the subject of 75 consultations involving participants representing a wide range

of countries and disaster-related interests. The consultations were organised by the UNISDR in preparation for a mammoth international meeting—the Global Platform for Disaster Risk Reduction—to be held in Geneva next week. The most eagerly awaited outcome of the meeting will be a decision on what should succeed the current Hyogo Framework when it reaches its 2015 closure. Some are hoping for a somewhat improved Hyogo Framework. Others, for a completely new framework. And yet others, a framework embedded in the current UN Millennium Development Goals. Certainly, the choice of Geneva as a venue is reassuring: a UN disaster risk index puts Switzerland among the five countries least vulnerable to a disaster.

John Maurice