

IT'S NASTY WEATHER EVERYWHERE

Extreme climatic conditions are now occurring in too many places at the same time, impacting millions and costing billions. **BY CECILIA TORTAJADA AND ASIT K BISWAS**

THE 2014 report of the Intergovernmental Panel on Climate Change has warned that extreme climatic events are likely to be more frequent in the future. Any reasonably well-informed person must have noted the preponderance of extreme climatic events such as prolonged droughts, heavy rainfall, intense floods, hotter and longer heatwaves, and cold spells all over the world in recent years. Throughout human history, climatic fluctuations have been a fact of life. However, episodes of extreme weather occurred at any specific time only in a few countries. What has been unusual is the number of intense heat or cold spells and high or low rainfalls that have been observed concurrently in many parts of the world around the same time.

The World Meteorological Organisation (WMO) monitors the global weather. It notes that in the first two months of 2014, we witnessed unusual extreme events at the same time in many parts of the world, resulting in disruptions to transport, food production and electricity generation and distribution. The following are some extreme weather events in the past 10 years.

INDIA

In July 2005, Mumbai received 944 mm of rain in 24 hours – nearly 40 per cent of the city's annual average rainfall in just one day. The drainage system of the city was over 100 years old, and its operation and maintenance practices have been consistently poor over decades. The resulting flood contributed to over US\$2 billion in damages and 927 deaths in Greater Mumbai alone. Across north-west India, this flood affected some 35,000 sq km of area and 20 million people. Regional damages have been estimated at US\$3-5 billion.

In June 2013, the Indian state of Uttarakhand suffered a heavy flood whose impact was attenuated because of massive deforestation for road and building construction, non-existent land use planning, extensive construction (both legal and unauthorised) in slopes and flood plains, badly planned mining activities, massive disposal of debris and solid waste on river beds, and rampant corruption. All these social, economic and environmental factors exacerbated the impact of the resulting heavy monsoon flood. The Indian army evacuated more than 110,000 people. The death toll was officially estimated at 6,000 but independent observers put it at around 30,000. In 2013 alone, the area lost US\$1 billion in tourism income. The World Bank estimated total loss at US\$3.8 billion. In September 2014, India suffered another catastrophic flood in Kashmir Valley which led to more than 420 deaths and affected around 6,000 km of roads, 3,000 water supply systems and 3,000 electricity substations. The flood affected 651,000 ha of agricultural land, and preliminary estimates indicate that it resulted in around US\$10 billion of damages.

CHINA

China experienced the worst winter in five decades in 2008 when 78 million people were affected by freezing temperatures and record snowfall. In 2010, Zhaquo county, Gansu province, was hit with a devastating flood killing 1,500 people. In 2010, many parts of China had the coldest winter for at least 50 years. In 2013, Shanghai had the hottest summer in 140 years.

SOUTH-EAST ASIA

Malaysia, Thailand and Indonesia are now facing severe flooding. More than 160,000 people had to be evacuated in eight states of Malaysia, and 21 deaths have so far been reported. In four provinces of Southern Thailand, floods have affected over 567,000 people, some 8,000 were evacuated and 14 have died. Aceh is the worst flood-affected province of Indonesia – around 121,000 people had to be evacuated.

Tropic cyclone Nargis was the worst natural disaster to hit Myanmar in November 2013. It killed at least 140,000 people and wrecked the lives of 2.4 million others. Even a year later, 500,000 people are still homeless, 200,000 have no access to water and 350,000 are receiving food aid from the World Food Programme. The Philippines was hit by Typhoon Durian in 2006 which killed more than 1,000 people. It was again hit in November 2013 by Typhoon Haiyan. It is the deadliest typhoon in its history, killing more than 6,200 people and affecting another 11 million people. In 2014, parts of Indonesia also suffered severe floods, affecting coffee production, while other parts faced drought. The dry conditions increased slash-and-burn agriculture and forest fires which contributed to haze over the region. Some 15 provinces of Thailand were officially declared drought-stricken, and thus were eligible for emergency funding. In Vietnam, 37 out of 58 provinces were under higher risk for forest fires due to dry conditions.

SOUTH ASIA

In 2010, Pakistan witnessed the worst flood in its history which killed at least 1,700 people and affected another 20 million. It contributed to damages of US\$11.1 billion and reconstruction costs of US\$8.9 billion. Some one million people from Pakistan's Sindh province faced serious drought in 2013-2014. In 2013, nearly 20 per cent of the state of Maharashtra, India, suffered the worst drought in 40 years. In 2012, drought reduced India's gross domestic product (GDP) by 0.5 per cent.

AUSTRALIA

It had a millennial drought that started in 1995 and was officially declared to be over in 2012. However, 2013 was the hottest year ever recorded. The drought is back again with a vengeance in parts of Queensland which is home to the country's estimated 27 million cattle. The Australian government recently announced A\$320 million (S\$346 million) in support for the farmers. Cloncurry, a town of 3,000 people in Queensland, is considering evacuating every resident because it has not rained for two years.

CANADA AND USA

The polar vortex brought in record temperatures in both countries. Texas received snow and also had a record dry spell in 2011. In 2012, much of the Midwest witnessed the worst drought since the Dust Bowl years of the 1930s. Cattle herds had to be reduced, which drove beef prices to record levels in the US, which is the world's beef producer. In Texas alone, the 2011 drought resulted in US\$7.62 billion of losses, including US\$3.23 billion in livestock. For the current drought, California has approved US\$647 million for drought amelioration measures, and President Barack Obama has pledged US\$183 million in federal funds.

Superstorm Sandy hit north-eastern US in October 2012. According to the National Hurricane Centre, it resulted in 159 deaths, and caused an estimated damage of US\$50 billion, second only to Hurricane Katrina which resulted in US\$108 billion damages in 2005.

LATIN AMERICA

Argentina, Brazil, Paraguay and Uruguay witnessed a prolonged and severe drought in 2008, one of the most serious ever recorded, inflicting heavy losses to agriculture, livestock and water resources. In 2014, Argentina and Brazil experienced record heat and drought. Drought in Brazil, the world's biggest coffee producer, contributed to a sharp spike in coffee prices to over US\$2 per pound. It will also significantly reduce soya bean production. The prolonged drought is threatening Sao Paulo's water supply. The Cantareira water system, which provides water to some 10 million people, is under severe stress. During its wettest period from December 2013 to February 2014, the Sao Paulo region received rainfall 60 per cent below normal. The situation has not improved. The reservoirs that supply the city are now at record low levels.

MEXICO

The country witnessed massive flooding, the worst weather-related disaster in history. For the first time in nearly 60 years Mexico was confronted with Hurricane Manuel from the Pacific and Hurricane Ingrid from the Atlantic which made near simultaneous landfall on Sept 15, 2013, affecting 250,000 people.

EUROPE

In 2007, Britain experienced its worst flood in 60 years. It also had the wettest winter in 250 years in 2013-14, resulting in serious floods in many parts of the country. In 2010, western Russia experienced extreme heat and drought. More than 140 towns in Russia suffered heavy flooding in 2013, worst in 120 years. In 2009-10, Europe suffered from extreme cold waves and record snowfalls. Britain, Finland, Hungary and Portugal recorded heat waves in 2013. Austria, Belarus, the Czech Republic, south and east Germany, Hungary, Poland, Serbia and Switzerland experienced heavy flooding. Many of these areas experienced rainfall that occurs on average only once in 100 years.

This is only a partial catalogue of extreme climatic events that the world has seen since 2005. It is worth noting that extreme climatic events are not new phenomena. They have always occurred historically in specific parts of the globe. What is unusual, however, is that these extreme events are now occurring in too many places around the same time. The occurrence of these events confirm the findings of the Intergovernmental Panel on Climate Change that the number, frequency and magnitude of these extreme weather events are likely to rise.

Munich Re, one of the world's largest insurance companies which collects data on all disasters, reported that the number of extreme weather events and earthquakes in 2013 was nearly 40 per cent higher compared with the average of the last 30 years.

With increasing urbanisation and economic activities, there is no question that future economic losses from similar levels of extreme weather events will continue to increase in the future. In addition, if the frequency and magnitude of these extreme events increase in the coming years, as many experts expect, their economic impact is likely to increase very significantly with time.

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