

# CHAPTER 1

## THE YEAR OF RECURRING DISASTERS

**N**atural disasters are like snowflakes – while there are often many similarities between them, no two are alike. And yet in reviewing major disasters in 2012, we were struck by the fact that several of the biggest disasters last year were preceded in 2011 by similar events. In 2012 another destructive storm wreaked havoc in the southern Philippines, following a devastating storm in 2011; the United States’ east coast – including New York City – was hit by the second devastating storm in a row. For Pakistan, it was the third year in which millions were affected by floods.

In this chapter, we take a closer look at some of the parallels between those disasters, particularly to see if governments and humanitarian actors have learned lessons from one year to the next. With Typhoon Bopha/Pablo (Philippines) being the deadliest disaster in 2012 and Hurricane Sandy the costliest and with the Pakistan floods affecting among the largest number of people, these disasters represent an important cross-section of disasters occurring in 2012. In addition to discussing recurring disasters, this chapter also provides an overview of disasters occurring in the course of the year and analyzes trends in humanitarian funding.

### SECTION 1

#### Disaster Statistics and Trends in 2012

2012 did not experience any mega-disasters – a fact which is reflected in the lower numbers of fatalities, which are approximately a third of fatalities occurring in 2011 (which witnessed the Japanese earthquake and tsunami) and a thirtieth of fatalities in 2010 (which witnessed the Haiti earthquake). Death rates in 2012 were down to about a tenth of the decade’s yearly average.

Looking at other indicators, the disaster trends of 2012 are less clear. Munich Re’s natural catastrophe loss database (NatCatService) reports a relatively high number of ‘loss events,’ albeit less than in the record year of 2010.<sup>5</sup> Some 905 loss events were reported in 2012, 85 more than in 2011 and one of the five highest numbers since 1980. Meanwhile, the International Disaster Database, EM-DAT, reported 310 disasters, a smaller number of disasters than in 2011.<sup>6</sup> As Munich Re includes smaller disasters in its database than EM-DAT, this probably means that there were a higher number of smaller disasters in 2012

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<sup>5</sup> Munich Re’s NatCatSERVICE database records loss events due to natural hazards resulting in property damage or bodily injury. See: Munich Re, *NatCatSERVICE, Natural catastrophe know-how for risk management and research*, 2011.

<sup>6</sup> Source of data: EM-DAT: The OFDA/CRED - International Disaster Database [www.emdat.be](http://www.emdat.be) Université catholique de Louvain Brussels – Belgium, in: UNISDR, USAID and CRED, “2012, disasters in numbers,” 14 March 2013, <http://reliefweb.int/report/world/economic-losses-disasters-set-new-record-2012>; EM-DAT data are subject to revisions because of retrospective analysis (see Annex 1 for explanation).

compared to 2011, but fewer larger ones.<sup>7</sup> In terms of persons affected by disasters, the number of persons affected by natural disasters in 2012 was with 106 million affected, far lower than the 209 million in 2011, and so was also lower than the average of approximately 269 million persons affected by natural disasters per year between 2002 and 2011.<sup>8</sup>

**Table 1** Natural Disasters Worldwide, 2002-2012<sup>9</sup>

	2002-11 avg.	2010	2011	2012 <sup>10</sup>
<b>Number of recorded disasters (EM-DAT)</b>	396	411	336	310
<b>Natural catastrophes (Munich Re) (loss events)</b>	800	960	820	905
<b>Fatalities (EM-DAT)</b>	114,502	297,730	31,105	9,330
<b>Fatalities (Munich Re)</b>	106,000	295,000	27,000	9,600
<b>Persons affected (thousand) (EM-DAT)</b>	268,280	343,864	209,512	106,087
<b>Damage (\$ billions) (EM-DAT)</b>	142,5	135	366	138
<b>Overall losses (\$ billions) (Munich Re)</b>	165	150	380	160

In terms of disaster losses, 2012 was slightly below the 10-year average (2002-2012). In comparison with the record year of 2011,<sup>11</sup> which saw massive disaster losses of over \$360 billion, especially in developed countries, losses in 2012 were about \$160 billion – still a staggering amount (almost equivalent to the GDP of New Zealand) and the seventh highest annual total of direct losses since 1980.<sup>12</sup>

<sup>7</sup> See Annex I for further information on the two databases.

<sup>8</sup> See Annex I of this review for a discussion of criteria used to determine persons “affected” by disasters.

<sup>9</sup> The figures in this table are derived from: Munich Re data for 2012 and 2002-2011 averages and EM-DAT for 2012. See: Munich Re, *2012 Natural Catastrophe Year in Review*, 3 January 2013; Münchener Rückversicherungs-Gesellschaft, Geo Risks Research, NatCatSERVICE, accessed 4 February 2013; EM-DAT data for 2012: Source of data: EM-DAT: The OFDA/CRED - International Disaster Database [www.emdat.be](http://www.emdat.be) Université catholique de Louvain Brussels – Belgium, in: UNISDR, USAID and CRED, “2012, disasters in numbers,” 14 March 2013, <http://reliefweb.int/report/world/economic-losses-disasters-set-new-record-2012>; EM-DAT data for 2002-2011: Philippe Hoyois and Regina Below, “Disaster data,” in: International Federation of Red Cross and Red Crescent Societies, *World Disaster Report 2012: Focus on forced migration and displacement*, 2012, p. 260 ff., Source: EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, [www.emdat.be](http://www.emdat.be)

<sup>10</sup> EM-DAT data for 2012: UNISDR, USAID and CRED, “2012, disasters in numbers,” op. cit. EM-DAT data are subject to revisions because of retrospective analysis (see Annex 1 for explanation).

<sup>11</sup> For more discussion of the economic losses from disasters and 2011 data, see: Elizabeth Ferris and Daniel Petz, *The Year that Shook the Rich: A Review of Natural Disasters in 2011*, Brookings-LSE Project on Internal Displacement, [www.brookings.edu/research/reports/2012/03/natural-disaster-review-ferris](http://www.brookings.edu/research/reports/2012/03/natural-disaster-review-ferris)

<sup>12</sup> Loss data from Munich Re, *2012 Natural Catastrophe Year in Review*, 3 January 2013; GDP data from Central Intelligence Agency, *The World Factbook*, GDP (official exchange rate), [www.cia.gov/library/publications/the-world-factbook/fields/2195.html](http://www.cia.gov/library/publications/the-world-factbook/fields/2195.html)

**Table 2** Natural Disasters in 2012 by Number of Fatalities<sup>13</sup>

Country	Disaster	Month	Fatalities
<b>Philippines</b>	Typhoon Bhopa/Pablo	December	1,901 <sup>14</sup>
<b>Europe<sup>15</sup></b>	Cold Wave	January-February	587
<b>Pakistan</b>	Flood	August-October	480
<b>Nigeria</b>	Flood	July-October	363
<b>Iran</b>	Earthquakes	August	306
<b>Peru</b>	Cold wave	June	252
<b>Russia</b>	Flash Flood	July	171
<b>Korea Dem P Rep</b>	Flood	July	169
<b>USA, Caribbean</b>	Hurricane Sandy	October	141/220 <sup>16</sup>
<b>Pakistan</b>	Avalanche	April	135
<b>China</b>	Flood	April-May	132
<b>India</b>	Flood	June-July	120
<b>Total 2012</b>			<b>9,330</b>

In terms of disasters with the most fatalities (see Table 2), the list is topped by Typhoon Bopha/Pablo in the Philippines, followed by a cold wave in Europe early in the year. These are followed by floods in Pakistan and Nigeria and the twin earthquakes in Iran. With over 3,400 fatalities, floods were the deadliest hazard in 2012, closely followed by storms (3,027). Extreme temperatures killed over 1,600 people and earthquakes more than 700.<sup>17</sup> A majority of the twelve deadliest disasters of 2011 took place in Asia (seven out of twelve), which is consistent with the trend of Asia reporting the largest number of disaster fatalities over the last decade.<sup>18</sup> Two of the deadliest disasters occurred in Europe, two in the Americas and one in Africa. Half of the twelve deadliest disasters were floods and all but the Iran earthquakes were hydro-meteorological disasters.

<sup>13</sup> EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, accessed 5 February 2013, Source of data: EM-DAT: The OFDA/CRED - International Disaster Database [www.emdat.be](http://www.emdat.be) Université catholique de Louvain Brussels – Belgium, in: UNISDR, USAID and CRED, “2012, disasters in numbers,” 14 March 2013, <http://reliefweb.int/report/world/economic-losses-disasters-set-new-record-2012>

<sup>14</sup> Munich Re, 2012 Natural Catastrophe Year in Review, 3 January 2013, p. 39.

<sup>15</sup> The highest numbers of deaths were recorded in Ukraine (112 deaths), Romania (86), Poland (82) and Russia (64). EM-DAT, Disaster List, accessed 11 January 2013, [www.emdat.be/disaster-list](http://www.emdat.be/disaster-list)

<sup>16</sup> EM-DAT cumulative numbers for USA, Haiti, Cuba, Jamaica, Bahamas, accessed 5 February 2013. Munich Re puts the number of fatalities from Sandy at 220. See: Munich Re, 2012 Natural Catastrophe Year in Review, 3 January 2013, p. 33.

<sup>17</sup> UNISDR, USAID and CRED, “2012, Disasters in Numbers,” op. cit.

<sup>18</sup> From 2002-2011 EM-DAT reports 744,138 reported fatalities by natural disasters in Asia, which account for 65 percent of the global total of 1.15 million during that time period. See: Philippe Hoyois and Regina Below, “Disaster data,” in: International Federation of Red Cross and Red Crescent Societies, *World Disaster Report 2012: Focus on forced migration and displacement, 2012*, p. 260 ff., Source: EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, [www.emdat.be](http://www.emdat.be)

**Table 3 Major Disasters in 2012 in Terms of Affected Population<sup>19</sup>**

Country	Disaster	Month	Affected (millions)
<b>Sahel (Chad, Gambia, Niger, Mali, Mauritania, Senegal)</b>	Drought		12.9 (18.0) <sup>20</sup>
<b>China</b>	Flood	June-July	17.4
<b>China</b>	Flood	April-May	13.1
<b>Philippines</b>	Typhoon Bopha/ Pablo	November	6.2 <sup>21</sup>
<b>China</b>	Typhoon Haiku	August	6.0
<b>Pakistan</b>	Flood	August-October	5.0
<b>Philippines</b>	Flood	August	4.4
<b>China</b>	Flood	August	3.8

According to the international disaster database (EM-DAT) 106 million people were affected by disasters in 2012, a significant drop from 209 million that were affected in 2011. Following long-term trends, the largest number of people were affected by floods (62.3 million), followed by drought (24.9 million) and storms (16.4 million).<sup>22</sup> As indicated in Table 3, some of the disasters that affected the most people in 2012 were the drought in the Sahel, floods in China, Typhoon Bopha/Pablo in the Philippines, as well as floods inundating large parts of Manila, the capital of the Philippines. As already noted, Pakistan also saw major floods and even though fewer people were affected than in previous years, it was still one of the major disasters in 2012. Final numbers of affected people are not yet available for Hurricane Sandy, but it also affected millions, particularly in Cuba, Haiti and the US. In the US alone, 8.5 million people lost electricity during the storm.<sup>23</sup>

<sup>19</sup> Standards and definitions regarding persons affected by a disaster differ significantly from country to country. Different sources often show wide variations in numbers and thus should be treated with caution. If not indicated otherwise, data for this table are derived from EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, accessed 11 February 2013, [www.emdat.be](http://www.emdat.be)

<sup>20</sup> UN humanitarian agencies reported that due to drought and conflict 18 million persons were food insecure in the region. See for example: UN News Service, "Despite food assistance, Sahel food crisis still persists – UN agency," 14 September 2012, [www.un.org/apps/news/story.asp?NewsID=42892](http://www.un.org/apps/news/story.asp?NewsID=42892)

<sup>21</sup> OCHA, "Philippines: Typhoon Bopha, Situation Report No. 17," 29 January 2013, <http://reliefweb.int/report/philippines/typhoon-bopha-situation-report-no-17-29-january-2013>

<sup>22</sup> UNISDR and CRED, "2012, Disasters in Numbers," 14 March 2013, <http://reliefweb.int/report/world/economic-losses-disasters-set-new-record-2012>

<sup>23</sup> Christina DeConcini and Forbes Tompkins, "Impacts of Hurricane Sandy and the Climate Change Connection," Fact Sheet, World Resources Institute, 2012.

## SECTION 2

### Continuing, Recurring, Cascading Disasters

While there are frequent references in the literature to the term ‘recurring’ (or recurrent) disaster, there is little clarity about its meaning. The term ‘recurring disaster’ is used here to refer here to the recurrence of a single natural hazard in the same geographic region over a one-year period. In 2008, Haiti was struck by four hurricanes in the course of a year. Pakistan experienced flooding in 2010, 2011 and 2012. These are recurring disasters. From the beginnings of recorded history, there have been recurring disasters – annual flooding of the Nile River and regular monsoon rains in South Asia, for example. For millennia, human civilizations have adapted (albeit imperfectly) to seasonal variations in weather patterns. Yet today, population growth and patterns of human settlement, coupled with long-term global warming, seem to suggest that a higher number of people will be impacted by recurring disasters than ever before in human history.

Other hazards, such as droughts, can persist continuously for years. A drought lasting five years would, by our understanding, be categorized as a single disaster. In some regions, though, droughts occur regularly, with shorter or longer breaks in between. In those instances, if they recur in sufficiently short intervals, we can speak of recurring disasters. Also, while floods are often considered to be a sudden-onset disaster, they can actually be drawn-out affairs. For example, in Colombia in 2010, continuous rainfall caused continuous flooding throughout the country.<sup>24</sup> This can also be considered as a single continuous disaster.

But the interaction between natural hazards is even more complex. Some natural hazards tend to occur together; cyclones and hurricanes, for example, often cause flooding and landslides. Earthquakes can cause tsunamis. And, as discussed below, it is usually the intersection between natural hazards and human action that makes a natural hazard a disaster.

There are also many cases where more than one hazard occurs within the same year (or sometimes within the same week). For example, in 2012 seven Asian countries experienced two different natural hazards during the course of the year: Afghanistan (drought and flood); Bangladesh and Vietnam (flood and storm); and India, Malaysia, Pakistan and Sri Lanka (flood and earthquake).<sup>25</sup> And, indeed, many national disaster management organizations plan on the basis of identifying and assessing multiple hazards and developing strategies for both multi-hazard mitigation and response.<sup>26</sup>

There are also what might be considered cascading disasters where one natural hazard triggers another and/or where a natural hazard leads to another type of disaster. For example, in 2011, the Great East Japan earthquake caused a tsunami, damaging a nuclear

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<sup>24</sup> Alice Thomas, *Surviving Alone: Improving Assistance to Colombia's Flood Victims*, Refugees International, May 2011, <http://refugeesinternational.org/policy/in-depth-report/surviving-alone-improving-assistance-colombias-flood-victims>

<sup>25</sup> IRIN, “Asia’s 2012 figures and trends,” 11 December 2012, <http://reliefweb.int/report/world/asias-2012-figures-and-trends>

<sup>26</sup> See for example: FEMA’s initiatives at multi-hazard mitigation planning, <http://www.fema.gov/multi-hazard-mitigation-planning>

plant, which in turn posed a threat to human life. An earthquake can lead to the collapse of a dam, causing major flooding or a heat wave can cause wildfires as occurred in Russia in 2010.

The eruption of Mount Pinatubo in the Philippines in June 1991 illustrates some of the complexity of the interrelationship of disasters. Earthquakes were recorded in the month preceding the eruption of the volcano, leading some scientists to predict that the earthquakes could be a sign of increasing volcanic activity or perhaps a contributing factor to the volcano's eruption. The eruption was the second strongest of the century (ten times stronger than Mt. Saint Helen's in 1980) and had global effects, causing an increase in worldwide ozone levels and a global decrease in temperature of 32.9 degrees Fahrenheit (0.5 degrees Celsius). But the volcano's effects were intensified by the fact that Typhoon Yunya struck the Philippines on the same day as the eruption, only 45 miles away from the volcano. The rains from the typhoon mixed with the ash of the volcanic eruption to create massive lahars – fast-flowing mudflows composed of a slurry of pyroclastic material, debris and water which can destroy communities quickly. Moreover, the longer-term effects of the lahars, the ash and the pollution created by the volcano contributed to crop failure and food insecurity. Long after the eruption, subsequent heavy rains triggered the formation of new lahars.

We suggest that more research is needed into the intersections between different types of natural hazards and to clarify the conceptual definitions and interactions between recurring, continuous and cascading disasters. Moreover, further work is needed to understand how the impact of natural hazards is affected by human activities – such as deforestation and the siting of industrial or nuclear plants. While humans have little control over whether a natural hazard occurs, they can take actions to determine its effects. Whether there are zero or 1,000 fatalities depends on the extent to which communities and governments are prepared to face natural hazards. Disaster risk (or vulnerability to natural hazards) is the result of both the likelihood of natural hazards and the vulnerability of populations to those hazards. For example, Haiti has experienced far greater destruction from a tropical storm than other countries have experienced from much stronger hurricanes.<sup>27</sup> A good illustration for this is the World Risk Index, which looks at the relationship between exposure to natural hazards and social vulnerability in calculating risk for all countries in the world, finding that Vanuatu, Tonga and the Philippines have the highest levels of risk in the world.<sup>28</sup> In all three cases, the risks are multi-hazard as the three countries are susceptible to typhoons, earthquakes and volcanoes. But the risks are also greater because of patterns of human settlement and the capacity of governments to take measures to adequately protect their populations against this risk.

What is the impact of recurring disasters? When disasters recur frequently, the result is often chronic poverty. Disasters destroy material goods (homes, schools, infrastructure, livestock, seeds) and also impact social capital (for example, decreasing access to

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<sup>27</sup> Elizabeth Ferris, "Haiti has had it all," in Susan Martin, ed., *Humanitarian Crises and Migration: Causes, Consequences and Responses*, Routledge, forthcoming.

<sup>28</sup> United Nations University, "WorldRiskReport 2012: Environmental degradation increases disaster risk worldwide," 11 October 2012, <http://www.ehs.unu.edu/article/read/worldriskreport-2012>

education, eroding social norms and values, contributing to incentives for longer-term migration).<sup>29</sup> In a sense, it is a vicious cycle. Chronic poverty makes it difficult to take the measures necessary to mitigate against the effects of disasters. When they do occur, disasters can wipe out resources and increase poverty. The World Risk Index helpfully distinguishes between coping strategies – to respond to an immediate disaster – and longer-term adaptation capacities to prepare for future hazards, suggesting that these require different resources and approaches.<sup>30</sup>

In one of the few academic studies to focus specifically on the psychological effects of recurring disasters, Omori and Fujimori suggest that differences in perception of the imminence of the threat are key to understanding the effects on affected communities. In particular, they suggest that there is a difference between the likelihood that a monsoon will occur again versus the stress of being near a volcano that has erupted and may erupt again. They examine the case of the eruption of the Oyama volcano on Miyake-island in Japan 2000 which led to the evacuation of the population for nearly five years. However, when the population returned, they found continuing volcanic gas emissions and lived with threat of another eruption. Omori and Fujimori found that the psychological impact on the returnees was serious, and posited a close relationship between recurring disasters and disruptions of healthy living environments. They also point out that it is likely that the influences of sudden short-term disasters – which are perceived as one-time events – are different than recurring disasters. But there is little research on this area.<sup>31</sup>

Local communities often develop effective adaptation strategies to recurrent, small-scale disasters, as a series of case studies conducted by the UN Food and Agriculture Organization suggests. Local knowledge is particularly important in taking actions to mitigate the worst effects of natural hazards. But sudden-onset “extreme events are often perceived as ‘acts of God’” and may not lead to the development of preventive measures.<sup>32</sup> A number of studies suggest that recurrent events reduce the resilience of communities.<sup>33</sup> This makes intuitive sense. When a family or a community mobilizes to rebuild after a disaster, only to be hit by another disaster the following year, the incentive, assets and energy for rebuilding are likely to be less. And governmental authorities and international actors may find it more difficult to mobilize the funds and mechanisms to support reconstruction efforts.

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<sup>29</sup> Hossen M. Anwar, “The Impact of Recurring Natural Disasters on Chronic Poverty,” *Societies without Borders*, 2008, pp. 285-301, <http://societieswithoutborders.files.wordpress.com/2009/11/anwar3-1.pdf>

<sup>30</sup> United Nations University, “Fact Sheet WorldRiskReport 2012,” 11 October 2012, <http://www.ehs.unu.edu/file/get/10488.pdf>

<sup>31</sup> Tetsushi Omori and Tatsuo Fujimori, “Recurring Natural Disasters and their Psychological Effects on the Survivors,” *Yokohama Journal of Social Sciences*, vol. 15, no. 4, pp. 117-128, <http://kamome.lib.ynu.ac.jp/dspace/bitstream/10131/7395/1/9-Omori.pdf>

<sup>32</sup> United Nations FAO, *The Role of Local Institutions in Reducing Vulnerability to Recurrent Natural Disasters and in Sustainable Livelihoods Development*, April 2004. <ftp://ftp.fao.org/docrep/fao/007/ae079e/ae079e00.pdf>

<sup>33</sup> *Ibid*, p. 29. See also: IFRC, *The road to resilience, Bridging relief and development for a more sustainable future*, IFRC discussion paper on resilience – June 2012, <http://www.preventionweb.net/english/professional/publications/v.php?id=27375>

Humanitarian actors like to operate in a world of ‘lessons learned’ and ‘best practices.’ Crisis situations such as disasters offer important learning experiences and windows of opportunity for change. After a major disaster strikes, media outlets report the cries for reform and governments often feel the weight of popular pressure for better disaster prevention and response. However, the prospects for positive change can easily be derailed by other, competing priorities, particularly as resources are usually scarce. When disasters recur, however, there should be added incentive to develop the means of mitigating the risk of future disasters. There are (fortunately) cases where major disasters lead governments and humanitarian actors to re-think and adjust their approaches to disaster risk management. The 1995 Kobe earthquake brought about a major rethink on risk reduction; the 2004 Indian Ocean Tsunami brought human rights to the forefront of disaster management; the Great East Japan earthquake and tsunami of 2011 will likely bring improvements in thinking and planning for cascading disasters. It goes without saying that countries that experience recurring disasters have strong incentives to get their disaster management systems right.

A series of recurring disasters in 2012 (hurricanes Sandy and Irene in the US, typhoons Bopha and Wahsi in the Philippines, floods in Pakistan) present an opportunity to see how and if lessons were learned from one year to the next, if responses improved or not and which factors play a role in learning from disasters. It is clear that change takes time and physical adaptation and mitigation measures are difficult to implement in such a short period, particularly when the consequences of earlier disasters must be addressed at the same time. Having to deal with the impacts of major disasters two years in a row might actually slow down processes of change as disaster response is typically urgent and resource-intensive. The sequence of shocks that recurrent disasters cause can stress communities’ abilities to recover, but they can also bring out the best in communities and foster lasting change. In the absence of definitive studies on this subject, we hope that the comparisons offered below will offer some preliminary insights into the particular characteristics of recurring disasters.

## **Sandy and Irene**

In October 2012, Hurricane Sandy swept through the Caribbean, mid-Atlantic and northeastern United States. The storm in the Caribbean Sea was declared a Category 1 hurricane on 24 October by the National Hurricane Center (NHC). It made landfall in Jamaica that evening, strengthened to a Category 2 hurricane and made landfall in Cuba on 25 October. It then weakened to a tropical storm and passed through the Bahamas and re-strengthened to a Category 1 hurricane as it made its way to the United States. On 29 October, the storm system made landfall south of Atlantic City, New Jersey. At the time, Sandy’s classification was changed to ‘post-tropical storm’ because of the structural changes associated with moving into a colder environment. (Sandy was subsequently reclassified as a Category 1 hurricane, as analysis revealed that hurricane-strength winds had been recorded in the US as a result of Sandy).<sup>34</sup> At landfall, winds were reportedly 80

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<sup>34</sup> National Weather Service Forecast Office, “Storm Summary for Superstorm Sandy,” accessed 21 December 2012, [www.erh.noaa.gov/phi/storms/10292012.html](http://www.erh.noaa.gov/phi/storms/10292012.html)



miles per hour (129 kilometers per hour), affecting 24 states, particularly New York and New Jersey.<sup>35</sup>

As Jeff Masters points out, Sandy was the “largest, most powerful and second most destructive Atlantic hurricane on record.”<sup>36</sup> But it is important to examine this hurricane in a broader context. 2012 was the seventh consecutive year without a major hurricane to hit the US. Even though it was not initially considered a hurricane when it made landfall, Sandy was unique in its size and power; the total energy of tropical storm winds were 2.7 times higher than Katrina’s peak energy and no hurricane on record has been wider in geographic scope.<sup>37</sup>

Sandy wreaked havoc in the Caribbean, particularly in southern Haiti which had already suffered from Hurricane Isaac in August 2012, when more than a dozen people were killed. More than 20 inches (51 centimeters) of rain fell in Haiti due to Sandy, causing 54 deaths and destroying over 6,200 homes and damaging ten thousands throughout the country, with most damage in the south and southeast, according to the International Organization for Migration.<sup>38</sup> Prime Minister Laurent Lamothe described the storm as a “disaster of major proportions. The whole south is under water.”<sup>39</sup> According to figures from the government of Haiti, the agricultural sector lost one-third of its annual production due to Sandy, Tropical Storm Isaac in August, and drought.<sup>40</sup> One and a half million people faced food insecurity following Sandy.<sup>41</sup> Three years after the devastating 2010 earthquake, Sandy affected nearly 32,000 earthquake IDPs in 119 camps out of a total of 370,000 IDPs in 541 camps.<sup>42</sup> Of the total number of IDP camps, 218 had been affected by Isaac, while 78 camps

<sup>35</sup> Matt Smith, “Sandy wreaks havoc across Northeast; at least 11 dead,” *CNN*, 30 October 2012, accessed 21 December 2012, [www.cnn.com/2012/10/29/us/tropical-weather-sandy/index.html](http://www.cnn.com/2012/10/29/us/tropical-weather-sandy/index.html)

<sup>36</sup> Jeff Masters, “The bizarrely active hurricane season of 2012 draws to a close,” *Weather Underground*, 30 November 2012, [www.wunderground.com/blog/JeffMasters/comment.html?entrynum=2302](http://www.wunderground.com/blog/JeffMasters/comment.html?entrynum=2302)

<sup>37</sup> *Ibid.*

<sup>38</sup> IOM, “Fact Sheet – Unit of Housing and Public Buildings Construction (UCLBP) and Shelter and CCCM Cluster Haiti – January 2013,” January 2013, [www.iom.int/files/live/sites/iom/files/pbn/docs/UCLBP-CCCM-Shelter-Haiti-Jan2013.pdf](http://www.iom.int/files/live/sites/iom/files/pbn/docs/UCLBP-CCCM-Shelter-Haiti-Jan2013.pdf)

<sup>39</sup> ABC News, “Hurricane Sandy’s Death Toll Reaches 69 in Caribbean Countries, 29 October 2012, [http://abcnews.go.com/ABC\\_Univision/News/hurricane-sandy-leaves-destruction-wake/story?id=17588956](http://abcnews.go.com/ABC_Univision/News/hurricane-sandy-leaves-destruction-wake/story?id=17588956)

<sup>40</sup> OCHA, “UN calls for additional \$39 million to support the government of Haiti respond to the impact of Hurricane Sandy,” 12 November 2012, <http://reliefweb.int/report/haiti/un-calls-additional-39-million-support-government-haiti-respond-impact-hurricane-sandy>

<sup>41</sup> *Ibid.*; OCHA, “Haiti: Hundreds of thousands of people affected by Hurricane Sandy,” 2 November 2012, [www.unocha.org/top-stories/all-stories/haiti-hundreds-thousands-people-affected-hurricane-sandy](http://www.unocha.org/top-stories/all-stories/haiti-hundreds-thousands-people-affected-hurricane-sandy). See also: Jonathan Watts, “Aftermath of hurricane Sandy leaves Haiti facing new disaster,” *The Guardian*, 2 November 2012, [www.guardian.co.uk/world/2012/nov/02/aftermath-hurricane-sandy-haiti-disaster](http://www.guardian.co.uk/world/2012/nov/02/aftermath-hurricane-sandy-haiti-disaster)

<sup>42</sup> IOM, “IOM and its Partners Evacuate More than 1,200 Haitians Living in Camps,” 29 October 2012, <https://www.iom.int/cms/en/sites/iom/home/news-and-views/press-briefing-notes/pbn-2012/pbn-listing/iom-and-its-partners-evacuate-mo.html>; IDMC, “Haiti: Tropical Storm Sandy displaces 35,000 people, while over 31,000 earthquake IDPs are hit again,” 16 November 2012, [www.unhcr.org/refworld/docid/50acb3ec2.html](http://www.unhcr.org/refworld/docid/50acb3ec2.html) ; IOM, “Fact Sheet – Unit of Housing and Public Buildings Construction (UCLBP) and Shelter and CCCM Cluster Haiti – January 2013,” January 2013.

were affected by both Sandy and Isaac.<sup>43</sup> Sandy also left a band of destruction through other countries in the Caribbean. Eleven people were killed and 35,000 homes were destroyed in Cuba; Jamaica, Puerto Rico and the Bahamas each suffered one fatality from Sandy.<sup>44</sup>

The impact in the United States was serious – and costly. Sandy caused the death of 131 people. Wave heights reached a record 32.5 feet (almost 10 meters) in New York harbor – 25 percent higher than the previous record.<sup>45</sup> Parts of lower Manhattan and subway tunnels were flooded. Over 20,000 flights were cancelled.<sup>46</sup> Between 10,000 and 40,000 people were displaced, with the lower estimates indicating people who sought shelter in government-run shelters.<sup>47</sup>

The fact that the storm occurred a week before US presidential elections made the voting rights of those displaced by the storm an issue of political and human rights concern. Some observers felt that the storm's impact may have depressed voter turnout in some areas due to loss of electricity at some polling places. Authorities scrambled to make sure that voters were able to exercise their right to vote, extending voter registration deadlines, early voting and use of electronic ballots. In New Jersey and New York more than 250 polling locations were moved. An estimated one million New York voters lived in areas where polling places were affected by the storm, including 250,000 whose polling place were moved.<sup>48</sup>

The economic costs of Hurricane Sandy were estimated at between \$20 and \$50 billion; as discussed in our Annual Review of Natural Disasters in 2011, economic costs tend to be much higher for disasters occurring in developed countries. Another effect of the storm in the United States was much greater recognition in American political discourse of the relationship between sudden-onset natural disasters and climate change. As former vice president Al Gore stated, "Hurricane Sandy is a disturbing sign of things to come. We must heed the warning and act quickly to solve the climate crisis."<sup>49</sup> And President Obama referred to damages caused by Hurricane Sandy in calling for increased action on climate change in his January 2013 State of the Union address.<sup>50</sup>

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<sup>43</sup> IOM, "Fact Sheet – Unit of Housing and Public Buildings Construction (UCLBP) and Shelter and CCCM Cluster Haiti – January 2013," January 2013.

<sup>44</sup> Jeff Masters, "Massive Hurricane Sandy building a huge and destructive storm surge," *Weather Underground*, 28 October 2012, Last Accessed 21 December 2012, [www.wunderground.com/blog/JeffMasters/article.html?entrynum=2278](http://www.wunderground.com/blog/JeffMasters/article.html?entrynum=2278)

<sup>45</sup> Christina DeConcini and Forbes Tompkins, "Impacts of Hurricane Sandy and the Climate Change Connection," *World Resources Institute Fact Sheet*, 2012.

<sup>46</sup> *Ibid.*, p. 2.

<sup>47</sup> Malcolm Jones, "What to Do With the Thousands Displaced by Hurricane Sandy?" *The Daily Beast*, 8 November 2012, [www.thedailybeast.com/articles/2012/11/08/what-to-do-with-the-thousands-displaced-by-hurricane-sandy.html](http://www.thedailybeast.com/articles/2012/11/08/what-to-do-with-the-thousands-displaced-by-hurricane-sandy.html)

<sup>48</sup> Eric A. Fischer and Kevin J. Coleman, "Hurricane Sandy and the 2012 Elections: Fact Sheet," *Congressional Research Service*, 8 November 2012, pp. 2-3.

<sup>49</sup> Al Gore, "On Hurricane Sandy," *The Huffington Post*, [http://www.huffingtonpost.com/al-gore/statement-on-hurricane-sa\\_b\\_2045406.html](http://www.huffingtonpost.com/al-gore/statement-on-hurricane-sa_b_2045406.html)

<sup>50</sup> Politico, "Obama to Congress in State of the Union: Act on climate or I will," 12 February 2013, <http://www.politico.com/story/2013/02/obama-to-congress-act-on-climate-or-i-will-87555.html>

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Sandy followed a path reminiscent of Hurricane Irene the year before.<sup>51</sup> Irene landed in North Carolina as a hurricane, transitioning into a tropical storm before hitting New York City on 28 August 2011. In the case of Irene, the government ordered the evacuation of about 370,000 residents and New York officials ordered the shutdown (for the first time ever because of a natural hazard) of the city's transit system. Although it was not considered a hurricane at the time, Irene's damage was extensive with 45 deaths, over 7 million people losing electric power and economic costs exceeding \$7 billion. At the time, Irene was seen as a fluke – it had been more than half a century since a storm of this magnitude hit New York.<sup>52</sup> And then just a year later, it happened again. Just as in 2011, people from New York and the northeast were evacuated and economic costs were high. In fact, Sandy – a larger and more powerful storm – caused approximately three times the economic damage of the previous year's 'unprecedented' tropical storm Irene. Like Irene, Sandy caused extensive damage before making landfall in the United States. Like Sandy, Irene, while still a hurricane, caused substantial damage in Puerto Rico and the Bahamas before hitting the United States.

The similarities between Sandy and Irene illustrate the difficulties in predicting – and preparing for – storms and hurricanes even in a developed country such as the United States. While Irene was seen as a once in a hundred year storm, just a year later, an even bigger storm struck the same general area.<sup>53</sup> Given the fact that climate change is making weather more unpredictable and increasing the likelihood of extreme events, efforts are urgently needed to prevent natural hazards such as hurricanes and tropical storms from becoming major disasters. Hurricane Sandy also confirms the lesson drawn from our Annual Review of Natural Disasters in 2011 that economic losses tend to be greater in developed countries even though the death toll is generally higher in less developed countries.<sup>54</sup>

US government response to both Irene and Sandy has improved substantially in the five years since Hurricane Katrina.<sup>55</sup> There have been extensive changes in FEMA and relationships between state and local disaster responders have been strengthened. In Connecticut, Governor Dan Malloy reported that response to Sandy was better than to

<sup>51</sup> For a comparison of the two, see: The Wall Street Journal, "Sandy vs. Irene: How Do the Storms Stack Up?" 28 October 2012, <http://blogs.wsj.com/metropolis/2012/10/28/hurricane-sandy-vs-irene-how-do-big-storms-stack-up/>

<sup>52</sup> Hurricane Carol made landfall on Eastern Long Island in 1954. Before this and the most powerful hurricane making landfall on Long Island was a 1938 Category 3 hurricane. Tropical storm Agnes in 1972 and Hurricane Donna in 1960 also caused major damage to the United States' East Coast. See: New York City Office of Emergency Management, "NYC Hazards: NYC Hurricane History," 19 February 2013, [www.nyc.gov/html/oem/html/hazards/storms\\_hurricanehistory.shtml](http://www.nyc.gov/html/oem/html/hazards/storms_hurricanehistory.shtml)

<sup>53</sup> Jeff Masters, "Irene's 1-in-100 year rains trigger deadly flooding," *Weather Underground*, 29 August 2011, [www.wunderground.com/blog/JeffMasters/comment.html?entrynum=1908](http://www.wunderground.com/blog/JeffMasters/comment.html?entrynum=1908)

<sup>54</sup> Elizabeth Ferris and Daniel Petz, *The Year that Shook the Rich, A Review of Natural Disasters in 2011*, Brookings-LSE Project on Internal Displacement, [www.brookings.edu/research/reports/2012/03/natural-disaster-review-ferris](http://www.brookings.edu/research/reports/2012/03/natural-disaster-review-ferris)

<sup>55</sup> Tim Starks, "Katrina's Lessons Seen In Response to Sandy," CQ, 29 December 2012, <http://public.cq.com/docs/weeklyreport/weeklyreport-000004197197.html>. For FEMA's analysis of its response to Hurricane Sandy, see: Written testimony of Federal Emergency Management Agency Administrator Craig Fugate for a House Committee on Transportation and Infrastructure hearing titled "A Review of the Preparedness, Response To and Recovery From Hurricane Sandy," 4 December 2012, <http://www.dhs.gov/news/2012/12/04/written-testimony-fema-administrator-house-committee-transportation-and>

Irene, in part because of drills carried out over the summer and new regulations intended to more rapidly restore power.<sup>56</sup> Power was restored faster after Sandy than after Irene although millions were left without power for weeks.<sup>57</sup>

Generator sales have gone up but home generators (which have caused several deaths through carbon-monoxide poisoning) cannot replace resilient public infrastructure. Another question surrounds zoning and rebuilding in coastal zones in the US. US government-backed flood-insurance has encouraged people to live in exposed coastal areas by subsidizing insurance. Rising sea levels caused by climate change, coastal erosion and possibly more severe storms in the future will not make the US east coast any safer. New York governor Andrew Cuomo already proposed to spend up to \$400 million to buy out property owners who live in high-risk coastal areas.<sup>58</sup> Meanwhile New Jersey governor Christie has indicated that he is not concerned about climate change.<sup>59</sup> Mitigating possible effects from future storms in New York City through building flood barriers or gates would cost billions of dollars, an investment that might be given more thought in light of the massive price tag of Sandy and Irene.

Sandy has brought the question of climate change to the forefront of the debate in the US but it remains to be seen if the shock (coupled with the hottest year in recorded history and the largest drought in decades) will lead to the development of more ambitious and comprehensive US climate change policies.

## Bopha and Washi

According to the 2012 World Risk Report,<sup>60</sup> the Philippines ranks third out of 173 countries in terms of disaster risk – a function both of its susceptibility to a variety of natural hazards (typhoons, volcanoes, earthquakes) and the vulnerabilities of populations exposed to these hazards. According to one study, while Japan and the Philippines face equal exposure to tropical cyclones, “a cyclone of the same intensity would kill 17 times more Filipinos” than Japanese due to the greater vulnerability of the population.<sup>61</sup>

<sup>56</sup> CBS News, “Malloy: Sandy Response Better Than Irene, Halloween Storm,” 8 November 2012 <http://newyork.cbslocal.com/2012/11/08/malloy-sandy-response-better-than-irene-halloween-storm/>

<sup>57</sup> Associated Press, “Power Outage Time after Sandy not Extraordinary,” 16 November 2012, <http://bigstory.ap.org/article/power-outage-time-after-sandy-not-extraordinary>

<sup>58</sup> Reuters, “New York’s post-Sandy home buyouts could cost \$400 mln,” 4 February 2013, <http://www.reuters.com/article/2013/02/05/storm-sandy-newyork-buyouts-idUSL1N0B4D1T20130205>

<sup>59</sup> Matt Katz, “Christie won’t consider climate change in rebuilding after Sandy; scientists say he should,” *The Inquirer*, 20 February 2013, [http://www.philly.com/philly/blogs/christie\\_chronicles/Call-for-Christie-to-consider-climate-change-in-rebuilding-.html](http://www.philly.com/philly/blogs/christie_chronicles/Call-for-Christie-to-consider-climate-change-in-rebuilding-.html). See also: Anna Sale, “Christie and Cuomo’s Dueling Visions for Post-Sandy Rebuilding,” WNYC News, 23 November 2012, <http://www.wnyc.org/articles/its-free-country/2012/nov/23/christie-and-cuomos-dueling-visions-post-sandy-rebuilding/>

<sup>60</sup> Alliance Development Works in cooperation with United Nations University and the Nature Conservancy, *WorldRiskReport 2012*, October 2012, <http://reliefweb.int/report/world/world-risk-report-2012-environmental-degradation-increases-disaster-risk-worldwide>

<sup>61</sup> Internal Displacement Monitoring Centre (IDMC) and Norwegian Refugee Council (NRC), *Disaster-induced internal displacement in the Philippines, The case of Tropical Storm Washi/Sendong, January 2013*, <http://www.preventionweb.net/english/professional/publications/v.php?id=30929>

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On 4 December 2012, Typhoon Bopha (known in the Philippines as Typhoon Pablo) struck the east coast of Mindanao island in the southern Philippines. This was the sixteenth most powerful typhoon in the history of the Philippines and the deadliest in the world in 2012. Just a year before, Tropical Storm Washi had hit the northern coast of the island, killing more than 1,250 people in December 2011. It should also be noted that this is a region which has experienced serious conflict for decades usually attributed to ethno-religious conflict.

Bopha made landfall three times as it damaged or destroyed over 233,000 houses and affected over 6.2 million people. "Entire families were washed away," Interior Minister Manuel Roxas told reporters.<sup>62</sup> As of 5 February 2013, the death toll stood at 1,146 with an additional 834 people still missing. Months after the typhoon struck, more than 8,000 people were still living in 97 evacuation centers and over 925,000 displaced people were sheltered outside the evacuation centers.<sup>63</sup>

The government of the Philippines has a strong disaster response capacity and responded well both in preparing for the typhoon (e.g. prepositioning supplies and personnel) and evacuating communities in danger. ASEAN deployed an emergency assessment team and the UN Humanitarian Country Team provided rapid needs assessments, field coordination and information management. UNDP integrated early recovery approaches into the overall humanitarian response and yet much more support will be needed before the country recovers.

The damage caused by the typhoon was immense. Following the storm, nearly one million people were in need of food assistance and the destruction of banana and coconut plantations by the effects of the storm created serious long-term livelihoods needs. The worst-hit province, Compostela Valley, has been the center of the country's \$500 million banana export industry since the 1960s. As the world's third largest banana exporting country, about two thirds of the Philippines' exported bananas are grown in Compostela Valley and about 150,000 people normally depend on working on the plantations as their primary source of income. The destruction of banana plantations has had, and will continue to have, major economic consequences.<sup>64</sup>

More than two months after the typhoon, families were still trying to repair their homes, even in the midst of monsoon rains. Entire small towns, known locally as 'barangays,' were submerged following the flooding on 19 January in Davao City – and in the provinces of Davao del Norte and Compostela Valley. Coming shortly after the typhoon, the rains created a miserable situation for hundreds of thousands of people. People needed housing to stay dry in the storms, but housing reconstruction was painfully slow. Two months after the typhoon, the government and aid groups estimated that 95 percent of families recovering from the typhoon continued to live in the remains of their houses.<sup>65</sup>

<sup>62</sup> Erik de Castro, "Typhoon kills at least 283, hundreds missing, in Philippines," *Reuters*, 5 December 2012, <http://en-maktoob.news.yahoo.com/philippines-biggest-typhoon-kills-least-82-many-buried-040812763--business.html>

<sup>63</sup> OCHA, "Situation Report No. 18," 5 February 2013, <http://reliefweb.int/report/philippines/typhoon-bopha-situation-report-no-18-5-february-2013>

<sup>64</sup> IRIN, "Philippines Crop-based livelihoods hit by Typhoon Bopha," 9 January 2013, [www.irinnews.org/Report/97205/Crop-based-livelihoods-hit-by-Typhoon-Bopha](http://www.irinnews.org/Report/97205/Crop-based-livelihoods-hit-by-Typhoon-Bopha)

<sup>65</sup> IRIN, "'Building back worse' after Philippines typhoon," 8 February 2013, [www.irinnews.org/Report/97435/Building-back-worse-after-Philippines-typhoon](http://www.irinnews.org/Report/97435/Building-back-worse-after-Philippines-typhoon)

The issue of housing reconstruction is also tied up with efforts to reduce the risks of future disasters. As of February 2013, the government's Mines and Geosciences Bureau was assessing sites and making recommendations based on geohazard assessments in order to designate some areas as "no build zones" due to flood risks. Relocation sites were being identified and construction of new homes on these sites was expected to begin by March. The policy is that families living in no-build zones do not qualify for the government's emergency shelter assistance grant of \$245 (10,000 pesos). But, as experience has shown, the practice of relocating communities away from areas at risk of disaster is complicated.<sup>66</sup> Issues of acquiring land, of ensuring that relocated communities have access to services and livelihoods and of determining fair compensation have proven to be difficult in many settings. In the storm-affected areas of Mindanao, concerns are being raised about relocating indigenous communities from their ancestral domains as up to eighty percent of those affected by the typhoon are indigenous peoples.<sup>67</sup>

Barely one year earlier, the world's second most deadly disaster of 2011, Tropical Storm Washi (known as Sendong in the Philippines) landed along the east coast of Mindanao, killing more than 1,500 people, damaging over 50,000 homes and displacing some 430,900 people. Perhaps because of its vulnerability to disasters, the Philippines has been a leader in enacting legislation related to disaster risk reduction, especially the Philippine Disaster Risk Reduction and Management Act, which was signed into law in May 2010 and complements the 2009 Climate Change Act.<sup>68</sup> The Special Representative of the UN Secretary-General on Disaster Risk Reduction, Margareta Wahlström, has called the Philippines' laws on climate change adaptation and DRR "the best in the world" and indicative of a "shift from a reactive to a proactive stance in addressing disasters."<sup>69</sup> The legislation, for example, prescribes that a minimum of five percent of local government funds must be used for disasters, with a substantial part of the money being allocated toward risk reduction and resiliency building. The goal of this legislation is that there should be zero casualties because of a lack of aid.<sup>70</sup> However, legislation is insufficient unless it is supported by strong political will and adequate resources to ensure implementation.

While the Philippine government's preparations for Bopha are generally considered to reflect lessons learned from tropical storm Washi, one study on Washi found that the great majority of those displaced by Washi had been living in high-risk informal settlements – even though it was known that these were dangerous areas.<sup>71</sup> According to experts, unregulated,

<sup>66</sup> Elena Correa, ed., *Preventive Resettlement of Populations at Risk of Disaster, Experiences from Latin America*, Global Facility for Disaster Reduction and Recovery, 2011, <http://www.gfdr.org/gfdr/node/903>

<sup>67</sup> IRIN, "'Building back worse' after Philippines typhoon," 8 February 2013.

<sup>68</sup> Internal Displacement Monitoring Centre and Norwegian Refugee Council, *Disaster-induced internal displacement in the Philippines, The case of Tropical Storm Washi/Sendong*, January 2013, <http://Internal-displacement.org/>

<sup>69</sup> *Ibid.*, p. 4.

<sup>70</sup> James Darcy et al., *The Use of Evidence in Humanitarian Decision Making*, Feinstein International Center, Tufts University, Assessment Capacities Project (ACAPS) Operational Learning Paper, January 2013, p. 16, <http://sites.tufts.edu/feinstein/2013/the-use-of-evidence-in-humanitarian-decision-making>

<sup>71</sup> Internal Displacement Monitoring Centre and Norwegian Refugee Council, *Disaster-induced internal displacement in the Philippines, The case of Tropical Storm Washi/Sendong*, January 2013.

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small-scale mining had rendered many slopes saturated and pock-marked, making them unstable and prone to landslides and flash floods.<sup>72</sup> Of those who lost their homes, only an estimated six percent had been able to access a process to reclaim lost property or be compensated and very few had proof of ownership or formal tenancy agreements before the cyclone. The fact that temporary shelters and permanent relocation sites are located in landslide-prone areas means that people effectively moved from one risky home to another. A lack of documentation precluded some families from being able to move. Most of those officially relocated have found themselves far from livelihoods opportunities and resettlement has been slow because of the lack of available land and the high cost of building materials.<sup>73</sup>

The effects of the two consecutive major cyclones in the Philippines leads to the observation that there are no shortcuts to disaster risk reduction – it is inextricably linked to long-term development and peace processes. Over the past four decades, millions have been displaced in Mindanao, the poorest region of the country, due to armed conflict and human rights violations. Those most exposed to weather shocks are those who have been displaced by conflict. Those who have been displaced by conflict are also more likely to be poor.<sup>74</sup> In its Humanitarian Action Plan 2013 for the Philippines, the UN and its partners report that most communities in non-urban Mindanao are fragile due to conflict and natural disasters and that many communities at risk have been displaced multiple times in the past.<sup>75</sup>

Chronic poverty decreases resilience and makes it more difficult to recover from disasters, particularly recurrent disasters. And repeated natural disasters contribute to poverty by damaging material goods and depleting social capital. Finding solutions to disaster-induced displacement becomes more difficult when the economic options of affected communities are limited. Building disaster-resilient communities means not only making sure that people live in safe areas, but ensuring that economies offer sufficient livelihood opportunities. Even with a government seeking to do the right thing and investing in DRR, the effects of disaster risk reduction strategies will be limited unless poverty is alleviated, social capital is built and governance is improved.<sup>76</sup>

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<sup>72</sup> IRIN, “Crop-based livelihoods hit by Typhoon Bopha,” 9 January 2013, <http://www.irinnews.org/printreport.aspx?reportid=97205>

<sup>73</sup> IDMC and NRC, op. cit., p. 4.

<sup>74</sup> World Food Programme and the World Bank Group, *Violent Conflicts and Displacement in Central Mindanao, Challenges for recovery and development, Key Findings*, December 2011, [http://www.wfp.org/sites/default/files/WB-WFP%20Key%20Findings\\_0.pdf](http://www.wfp.org/sites/default/files/WB-WFP%20Key%20Findings_0.pdf)

<sup>75</sup> Ibid.

<sup>76</sup> See for example: AlertNet, “Filipino government makes climate change a top 2013 priority,” 27 January 2013, [www.trust.org/alertnet/news/filipino-government-makes-climate-change-a-top-2013-priority/](http://www.trust.org/alertnet/news/filipino-government-makes-climate-change-a-top-2013-priority/). See also: PreventionWeb, “Philippines: New disaster reduction law strengthens self-reliance,” 18 January 2011, <http://www.preventionweb.net/english/professional/news/v.php?id=17541>

## Pakistan: Floods and More Floods

Just as the Philippines experienced deadly typhoons two years in a row, Pakistan experienced recurring floods. In 2010, deadly floods affected 20 million people in Pakistan; in 2011, in roughly the same geographic areas, floods affected more than five million people. Once again in 2012, floods affected five million people.<sup>77</sup> Approximately 460,000 homes were destroyed and 265,000 people were displaced, taking shelter in makeshift relief camps in Baluchistan, Punjab and Sindh provinces. Food supplies were also severely impacted as over 1.12 million acres of crops were affected and over 9,600 cattle died.<sup>78</sup> As in the case of the Philippines, Pakistan has also experienced widespread displacement resulting from conflict.

Normally, a flood affecting five million people would be seen as a mega-disaster (after all, the 2004 Indian Ocean Tsunami affected about two million people). But in the case of Pakistan, the 2012 floods did not generate the same international attention as in the previous two years; perhaps recurring disasters the third time around are simply not deemed to be as news-worthy. Media attention is often linked to the mobilization of international funds.<sup>79</sup>

This was the third time in three years that some families had been affected by floods. There was criticism of the slow pace of relief from both national and international authorities.<sup>80</sup> Villagers in Sindh claimed that elected representatives had not visited them; that local land owners drained their own lands but those of the poor farmers are still flooded; and that they faced health concerns, especially a measles outbreak.<sup>81</sup> Some international agencies, such as the International Organization for Migration (IOM), simply lacked the resources to respond. In addition, there were difficulties for international aid workers to obtain and extend visas.<sup>82</sup> Responding to floods three years in a row was difficult for authorities, but especially for the affected populations. The shelter cluster which coordinates international response to this sector after disasters reported that by the end of 2012, most people had returned to their villages, but were living in shelters next to their destroyed houses, with three percent still living in camp-like settlements. Significant humanitarian needs remained,

<sup>77</sup> EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, accessed 5 February 2013, [www.emdat.be](http://www.emdat.be)

<sup>78</sup> UNICEF, "Five million affected by Pakistan floods," 18 October 2012, accessed 20 December 2012, [www.unicef.org.au/Media/Media-Releases/October-2012/Five-million-affected-by-Pakistan-floods.aspx](http://www.unicef.org.au/Media/Media-Releases/October-2012/Five-million-affected-by-Pakistan-floods.aspx)

<sup>79</sup> Elizabeth Ferris and Daniel Petz, *A Year of Living Dangerously: A Review of Natural Disasters in 2010*, Brookings-LSE Project on Internal Displacement, April 2011, <http://www.brookings.edu/research/reports/2011/04/nd-living-dangerously>

<sup>80</sup> Ahmed Mahvish, "Flood victims still waiting for help," 7 December 2012, <http://dawn.com/2012/12/07/flood-victims-still-waiting-for-help/>

<sup>81</sup> Hussain Imtiaz, "Flood victims still living under wretched conditions," 17 January 2013, [www.thenews.com.pk/Todays-News-3-154690-Flood-victims-still-living-under-wretched-conditions](http://www.thenews.com.pk/Todays-News-3-154690-Flood-victims-still-living-under-wretched-conditions); see also: "Government's poor relief measures more devastating than natural disasters," 24 November 2012, <http://tribune.com.pk/story/470360/govts-poor-relief-measures-more-devastating-than-natural-disasters/>

<sup>82</sup> The News, "IOM limiting flood response in Pakistan," 4 November 2012, [www.thenews.com.pk/Todays-News-6-140906-IOM-limiting-flood-response-in-Pakistan](http://www.thenews.com.pk/Todays-News-6-140906-IOM-limiting-flood-response-in-Pakistan). On visas see: OCHA, "Humanitarian Bulletin, Pakistan," Issue 10, 12 November-21 December 2012.



but, owing to a lack of funding, most international actors were scaling back or shutting down operations toward the end of 2012.<sup>83</sup>

A number of evaluations were undertaken during and after the 2010 floods and while the government implemented a number of reforms, the changes were not apparent to observers on the ground in 2012.<sup>84</sup> For developing countries such as Pakistan, where large swaths of the population live in poverty, recurring shocks are a severe impediment to social and economic advancement. The recurring floods in Pakistan are a prime example of the reasons why disaster risk reduction needs to be an integral part of any development agenda. It would therefore be an important sign if the international post-2015 development agenda would put a strong commitment to scaling up international support for risk reduction and disaster preparedness. The Rio+20 summit issued a clear statement urging the integration of disaster risk reduction into policies, plans, programs and budgets at all levels and its consideration within relevant future international frameworks.<sup>85</sup>

While there has been some, largely anecdotal, attention to the effects of recurring disasters, the cumulative effects of repeated natural hazards on individual and community coping skills remain largely unknown.<sup>86</sup> It seems obvious that people who have been displaced are usually more vulnerable when another natural disaster occurs. In Haiti, for example, those living in tents because of the 2010 earthquake were particularly affected by Hurricane Tomás in 2010 and Hurricanes Isaac and Sandy in 2012. But while most of those displaced by the Pakistan floods of 2010 and 2011 had moved out of temporary shelters by the time the 2012 floods occurred, it is unclear whether they had found durable solutions – or protection from the next round of flooding.

## Comparative Analysis

There are several common themes running through these comparisons of specific disasters in 2011 and 2012. First, displacement is a common characteristic, as evidenced by the repeated displacement of Pakistanis by flooding, of Filipinos by the typhoons and the displacement of people in nine US states affected by Hurricane Sandy who stayed in temporary Red Cross shelters.<sup>87</sup> Recovery from disasters depends on resolving displacement. In the past few years, much of the thinking about post-disaster recovery as well as disaster risk reduction has focused on the concept of resilience. Finding solutions

<sup>83</sup> OCHA, "Humanitarian Bulletin, Pakistan," Issue 10, 12 November-21 December 2012.

<sup>84</sup> The Guardian, "Pakistan 'nowhere near prepared for another major disaster,'" 3 August 2012, <http://www.guardian.co.uk/global-development/2012/aug/03/pakistan-nowhere-prepared-major-disaster>; see also: National Disaster Management Authority, *A Review of the Pakistan Flood Relief and Early Recovery Response Plan, Up to December 31, 2010*, 31 January 2011.

<sup>85</sup> UN System Task Team on the Post-2015 Development Agenda, *Building Resilience to Disasters Through Partnerships, Lessons from the Hyogo Framework for Action*, Thematic Think Piece, January 2013, p. 4.

<sup>86</sup> National Council for Science and the Environment, "13<sup>th</sup> National Conference on Science, Preparedness and Resilience," Washington, D.C., 15-17 January 2013, [www.environmentaldisasters.net/](http://www.environmentaldisasters.net/)

<sup>87</sup> New Jersey, New York, Pennsylvania, Connecticut, Rhode Island, Maryland, Delaware, Virginia and Massachusetts.

for those displaced by disasters must be a key component of building resilience. It is hard for the displaced to ‘bounce back’ when their lives are in limbo and they are living in temporary housing. Addressing displacement has to be front and center in recovery efforts.

A second common theme is the importance of policies of governments. The ways national and local governments prepare for and respond to disasters and aid in recovery efforts have an impact on the lives of people in communities affected by disasters. People have different expectations of their governments (New Jersey residents have different expectations of their authorities than Sindh residents, for example) but they all have a right to expect their governments to keep them safe and to assist them when natural hazards occur. This requires an investment in preparation, including through the development of adequate legal frameworks. In this respect, the Philippines stands out – its comprehensive disaster management law and policy is one of the best in the world; a new law on internal displacement which deals with displacement from disasters, conflict and development projects was in the final stages of approval as of February 2013. Since Hurricane Katrina, the US government has undertaken major reforms to strengthen its disaster response capacities, although residents of Sandy-affected areas were frustrated by the long delay in appropriating funds for recovery efforts.<sup>88</sup>

A third theme is that the international community can learn from prior experiences, particularly in acting upon early warnings. In comparison with the slow response of international actors to warning signs of drought in Somalia in 2011, the mobilization of response to drought in the Sahel in 2012 was much faster. Continual improvements are needed, particularly in consulting more with affected communities, refining early warning systems and adopting legal and administrative frameworks that address the particular concerns of those affected by natural hazards.

Finally, these comparisons of disasters in 2011 and 2012 suggest that in the future more preparation and resources will be needed to be able to respond effectively to hazards, particularly weather-related extreme events. In a sense, all of the 2012 disasters described above were foreseen in 2011, if not earlier. Pakistan will surely experience flooding in the future, typhoons will continue to strike the Philippines, and the possibility of major storms striking the northeastern United States in the near future cannot be ruled out. Measures to reduce the risk of disasters are not only an essential step in protecting communities in hazard-prone areas but are increasingly demanded by citizens. Taking steps to reduce the risk of future disasters is not an option but an imperative. The experiences of 2012 – which after all, was not a ‘bad’ year for disasters – are a clear sign that much more extensive work is needed to prepare for what are likely to be more intense and more frequent natural hazards.

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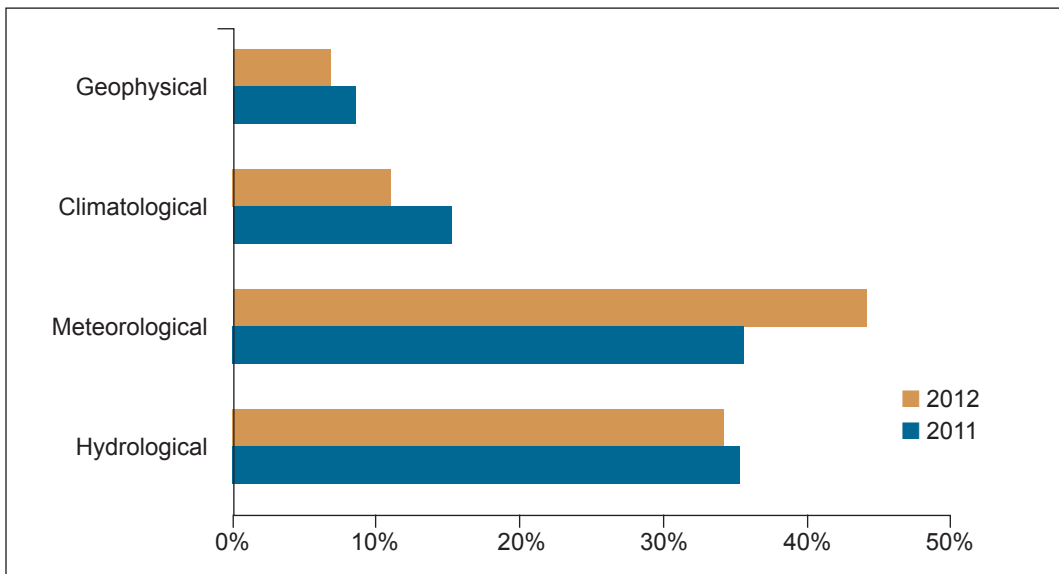
<sup>88</sup> Department of Homeland Security, “Written testimony of Federal Emergency Management Agency Administrator Craig Fugate for a House Committee on Transportation and Infrastructure hearing titled “A Review of the Preparedness, Response To and Recovery From Hurricane Sandy,” 4 December 2012, <http://www.dhs.gov/news/2012/12/04/written-testimony-fema-administrator-house-committee-transportation-and>

## SECTION 3

### Review of Some of the Major Disasters in 2012

The large majority of disasters in 2012 were hydro-meteorological in nature. Munich Re calculates that 45 percent of the 905 loss events in its database were caused by storms and 36 percent by hydrological disasters such as floods and avalanches. Twelve percent were caused by climatological events, such as extreme temperatures, droughts and forest fires, while the remaining six percent were caused by geophysical events (earthquakes, tsunamis, volcanic eruptions). Compared to 2011, storms became more prominent in 2012, while all other disaster categories declined.<sup>89</sup>

**Graph 1** 2011-2012 Disaster Loss Events by Disaster Category<sup>90</sup>



### Hydro-Meteorological Disasters

As noted, the large majority of disasters in 2012 were hydro-meteorological in nature with a particularly high percentage of loss events from storms. It is not easy to ascribe reasons for annual changes in natural hazards as many weather and climate extremes are the result of natural climate variability (including phenomena such as El Niño). In recent years, though, these natural decadal or multi-decadal variations have been intensified by

<sup>89</sup> Of the 310 disasters in 2012 reported by EM-DAT, 121 were floods, 77 storms, 49 extreme temperatures, 26 earthquakes, 19 droughts, 13 wet mass movements, 3 wild fires, 1 volcano and 1 wet mass movement. Source of data: EM-DAT: The OFDA/CRED - International Disaster Database [www.emdat.be](http://www.emdat.be) Université catholique de Louvain Brussels – Belgium, in: UNISDR, USAID and CRED, “2012, disasters in numbers,” 14 March 2013, <http://reliefweb.int/report/world/economic-losses-disasters-set-new-record-2012>.

<sup>90</sup> Munich Re, *2012 Natural Catastrophe Year in Review*, 3 January 2013, p. 32; and Munich Re, “Natural catastrophes worldwide 2011, Percentage distribution,” January 2012.

a globally warming climate which is changing precipitation and weather patterns, making certain kinds of extreme events and disasters more likely. Globally, 2012 was the tenth warmest year since record keeping began in 1880 and the thirty-sixth consecutive year with a global temperature over the twentieth century's average. It was also the warmest La Niña year on record.<sup>91</sup>

The Review of Natural Disasters in 2011 discussed in detail the probable effects of the La Niña event on 2011 disasters.<sup>92</sup> In 2012, after the 2010/11 La Niña episode came to a close in the early months of the year, the El Niño-Southern Oscillation (ENSO) moved to neutral (neither El Niño nor La Niña) and stayed there for the rest of the year. During ENSO-neutral periods the ocean temperatures, tropical rainfall patterns and atmospheric winds over the equatorial Pacific Ocean are near the long-term average.<sup>93</sup>

## Storms

We now take a brief look at some of the major areas facing tropical storm hazards: the Atlantic, West Pacific, East Pacific, Indian Ocean and Southern Hemisphere. Two of the largest disasters in 2012 were storms: Hurricane Sandy, which caused the largest damage and Typhoon Bopha, which killed the most persons in a single disaster. However, statistically the 2012 storm season was relatively quiet with 82 named storms, 44 of those above the hurricane/typhoon/cyclone threshold and 19 of them becoming major storms (Category 3 or above). To put this in context, the average for the 1980-2011 period is 85 named storms per year, with 47 of these storms passing the hurricane/typhoon/cyclone threshold.<sup>94</sup>

The 2012 Atlantic hurricane season was very active with 19 named storms – the third highest number since 1851 – but there were only two major hurricanes, Michael and Sandy.<sup>95</sup> As discussed above, Hurricane Sandy was the most expensive disaster of 2012 and one of the largest storms ever witnessed in the Atlantic, with tropical storm winds stretching over 943 miles (1517.6 kilometers) of the United States coast at landfall.<sup>96</sup>

<sup>91</sup> National Oceanic and Atmospheric Administration, National Climatic Data Center, "State of the Climate," accessed 11 February 2013, [www.ncdc.noaa.gov/sotc/?utm\\_source=dvr.it&utm\\_medium=twitter](http://www.ncdc.noaa.gov/sotc/?utm_source=dvr.it&utm_medium=twitter)

<sup>92</sup> Elizabeth Ferris and Daniel Petz, *The Year that Shook the Rich: A Review of Natural Disasters in 2011*, op. cit.

<sup>93</sup> La Niña is characterized by unusually cool ocean surface temperatures in the central and eastern tropical Pacific. La Niña is the opposite of El Niño, which is characterized by unusually warm ocean surface temperatures. Both La Niña and El Niño disrupt the large-scale ocean-atmospheric circulation patterns in the tropics and have important consequences for weather and climate around the globe. For updates on ENSO, see: NOAA/National Weather Service, Climate Prediction Center, "El Niño- Southern Oscillation (ENSO)," [www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/enso.shtml](http://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/enso.shtml)

<sup>94</sup> AON Benfield, *Annual Global Climate and Catastrophe Report, Impact Forecasting – 2012*, January 2013, p. 15.

<sup>95</sup> Hurricane Sandy was reclassified a major hurricane in February 2013. See: The Weather Channel, "Sandy: Hurricane Winds Reached U.S., NOAA Says," 13 February 2013, [www.weather.com/news/weather-hurricanes/sandy-major-hurricane-noaa-report-20130212?pageno=2](http://www.weather.com/news/weather-hurricanes/sandy-major-hurricane-noaa-report-20130212?pageno=2)

<sup>96</sup> Jeff Masters, "The bizarrely active hurricane season of 2012 draws to a close," *Weather Underground*, 30 November 2012, [www.wunderground.com/blog/JeffMasters/comment.html?entrynum=2302](http://www.wunderground.com/blog/JeffMasters/comment.html?entrynum=2302)

The Eastern Pacific hurricane season was moderately active with 14 storms, of which half became hurricanes; five developed into major hurricanes. However, few of the storms made landfall; Carlotta in June (landfall in southern Mexico) and Paul in October (landfall on Baja California Peninsula) caused the largest damages.<sup>97</sup>

The Western Pacific typhoon season was the most active since 2008, with 26 named storms, of which 16 became typhoons. Of the 16 typhoons, ten reached Category 3 or higher, which was eleven percent above the average from 1980-2012. With Typhoon Bopha, which reached maximum sustained winds of 160 miles per hour (260 kilometers per hour), the region saw the world's deadliest natural disaster in 2012.<sup>98</sup>

Cyclone activity was below average in the Indian Ocean with only three named storms (lower than the 32-year average of 4.7) and for the first time since 2009 no cyclones formed.<sup>99</sup> The most destructive event was tropical storm Nilam, which killed eight and displaced over 8,000 after making landfall in India's Tamil Nadu province in late October.<sup>100</sup>

The Southern Hemisphere saw a total of 18 named storms, which was 30 percent below average. Of those storms, eight cyclones formed, with three cyclones reaching Category 3 strength, which is more than 50 percent below the average since 1980. The most destructive storms in the region were Cyclone Giovanna, which made landfall in Madagascar in February and Tropical Storm Irina, which killed 77 persons in the same country.<sup>101</sup> Cyclone Evan crossed Samoa, Fiji, Tonga and other Pacific islands in mid-December, causing extensive damage and at least 14 fatalities.<sup>102</sup>

## Floods and Avalanches

### Floods in Russia

Heavy rains hit the town of Krymsk and neighboring towns in Russia's Krasnodar region in the early hours of 7 July 2012, resulting in torrential floods. Almost 11 inches (28 centimeters) of rain fell throughout the region in the middle of the night, catching most residents unaware. The volume of rainfall was unprecedented, with the equivalent of five months of rain falling overnight.<sup>103</sup> The flood wave was sixteen feet (five meters), inundating houses.<sup>104</sup>

<sup>97</sup> National Hurricane Center, "2012 Eastern Pacific Hurricane Season," accessed 11 January 2013, [www.nhc.noaa.gov/2012epac.shtml](http://www.nhc.noaa.gov/2012epac.shtml)

<sup>98</sup> AON Benfield, *Annual Global Climate and Catastrophe Report, Impact Forecasting – 2012*, January 2013, p. 15.

<sup>99</sup> *Ibid.*, p. 16.

<sup>100</sup> Sangeetha Rajeesh, "Eight Dead and Over 8,000 Displaced by Cyclone Nilam," *The New York Times*, 1 November 2012, <http://india.blogs.nytimes.com/2012/11/01/eight-dead-and-over-8000-hit-by-cyclone-nilam/>

<sup>101</sup> AON Benfield, *op. cit.*, p. 17. Fatality figure from EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, accessed 5 February 2013, [www.emdat.be](http://www.emdat.be)

<sup>102</sup> AON Benfield, *op. cit.*, p. 76.

<sup>103</sup> BBC News, "Russia flash floods: 144 killed in Krasnodar region," 8 July 2012, [www.bbc.co.uk/news/world-europe-18751198](http://www.bbc.co.uk/news/world-europe-18751198)

<sup>104</sup> See: Miriam Elder, "Russian floods kill 150 and leave thousands homeless," *The Guardian*, 8 July 2012,

According to the IFRC, approximately 34,650 people were affected by the floods and 7,200 homes were destroyed. In addition to the 171 fatalities, 3,910 people were injured.<sup>105</sup> The elderly were particularly vulnerable. According to residents of the region, officials knew that massive flooding was likely, but refused to issue timely warnings or evacuation orders.<sup>106</sup> Eventually, the Russian government acknowledged that it had received word of the pending floods at ten o'clock in the evening, but that it decided not to warn the population. The flood hit at about two o'clock in the morning. Russian president Vladimir Putin arrived in the region the same day and set up a commission to investigate the floods. Although denied by the government, rumors persisted that the flooding was caused by a deliberate opening of a sluice gate.<sup>107</sup> In spite of popular discontent with the government's response among affected communities and the arrest of some officials, there is no evidence that this has led to a change of policies or behavior on the part of authorities.<sup>108</sup>

### Floods in Bangladesh, India and China

India suffered multiple rounds of floods in 2012. Heavy monsoon rainfall caused the Brahmaputra River and its tributaries to flood the northeastern state of Assam twice in 2012, once in late June and again in September. The first round of floods affected more than 2.3 million people in over 4,000 villages across the state of Assam and was labeled the worst since 1998.<sup>109</sup> Flood waters breached 43 levees, affecting some areas that are not traditionally susceptible to floods.<sup>110</sup> Towards the end of the monsoon season, in September, rainfall caused floods and landslides in Assam and Sikkim, killing 33 and displacing more than a million people across northeast India.<sup>111</sup> In August, floods in northwestern India also killed 36 people as Rajasthan received its heaviest rainfall in over 30 years.<sup>112</sup> Further to the north, in Uttarakhand, 34 people were killed and more than 2,000 people took shelter in relief camps.<sup>113</sup>

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[www.guardian.co.uk/world/2012/jul/08/russia-floods-deaths](http://www.guardian.co.uk/world/2012/jul/08/russia-floods-deaths). Also see: Masha Lipman, "Floods and Suspicion in Russia," *The New Yorker*, 12 July 2012, [www.newyorker.com/online/blogs/newsdesk/2012/07/floods-and-suspicion-in-russia.html](http://www.newyorker.com/online/blogs/newsdesk/2012/07/floods-and-suspicion-in-russia.html)

<sup>105</sup> IFRC, "DREF Final Report Russian Federation: Flash Floods," DREF Operation number MDRRU015, 23 July 2012, p. 2, <http://reliefweb.int/sites/reliefweb.int/files/resources/MDRRU015dfr.pdf>

<sup>106</sup> Miriam Elder, op. cit.

<sup>107</sup> Ellen Barry, "After Russian Floods, Grief, Rage and Deep Mistrust," *The New York Times*, 10 July 2012, [www.nytimes.com/2012/07/11/world/europe/after-russian-floods-grief-rage-and-deep-mistrust.html?\\_r=0](http://www.nytimes.com/2012/07/11/world/europe/after-russian-floods-grief-rage-and-deep-mistrust.html?_r=0)

<sup>108</sup> Alina Lobzina, "Krymsk officials arrested over deadly flooding," *The Moscow News*, 23 July 2012, <http://themoscownews.com/russia/20120723/189988923.html>

<sup>109</sup> Sphere India, "Assam Floods 2012: Situation Analysis (21 August 2012)," ReliefWeb, <http://reliefweb.int/report/india/assam-floods-2012-situation-analysis-21-august-2012>

<sup>110</sup> Ibid.

<sup>111</sup> Biswajyoti Das, "Floods, landslides displace 1 million in India; 33 dead," *Reuters*, 24 September 2012, [www.reuters.com/article/2012/09/24/us-india-floods-idUSBRE88N08L20120924](http://www.reuters.com/article/2012/09/24/us-india-floods-idUSBRE88N08L20120924)

<sup>112</sup> Narayan Bareth, "Heavy rains in India's Rajasthan kill 36 people," *BBC News*, 27 August 2012, [www.bbc.co.uk/news/world-asia-india-19389163](http://www.bbc.co.uk/news/world-asia-india-19389163)

<sup>113</sup> BBC News, "India monsoon floods kill 34 in Uttarakhand," 6 August 2012, <http://www.bbc.co.uk/news/world-asia-india-19144580>

In Bangladesh, some five million people were affected by floods and landslides beginning on 23 June.<sup>114</sup> The city of Chittagong in eastern Bangladesh received 15.7 inches (40 centimeters) of monsoon rainfall within a single twelve hour period on 26 June 2012, causing flash floods and landslides around the city and in nearby villages.<sup>115</sup> Most deaths were caused by landslides and collapsing structures.<sup>116</sup> The monsoons displaced 600,000 people and many were still in temporary shelters several months after the flood waters receded.<sup>117</sup> Even when monsoon floods come as expected every year, their impact on human communities is severe.

China suffered multiple floods in 2012, a result of torrential rainfall and a series of typhoons that killed hundreds and cumulatively affected more than 40 million people in 28 provinces, autonomous regions and municipalities between January and August 2012.<sup>118</sup> In July, heavy rains caused floods in many parts of Beijing, resulting in \$1.5 billion in damage and economic losses and causing approximately 60,000 to be evacuated from their homes.<sup>119</sup> Officials initially claimed that 37 people had died during the floods; however, this number was later revised to 77.<sup>120</sup> The floods have widely been attributed to the inability of Beijing's antiquated drainage system to cope with the heaviest rainfall the city has received in 60 years.<sup>121</sup>

### **Avalanche in Pakistan**

On the morning of April 7, 2012, an avalanche buried the Gayari military base located near Pakistan's border with India in Kashmir under 21 meters of snow. Although the number of missing was initially estimated at 111 and revised to 135,<sup>122</sup> the military eventually declared 129 soldiers and eleven civilian personnel dead.<sup>123</sup> To date, more soldiers in the mountainous border region have died from weather conditions than in combat.<sup>124</sup>

<sup>114</sup> Reliefweb, "Bangladesh: Floods and Landslides - Jun 2012," accessed 19 February 2013, <http://reliefweb.int/disaster/fi-2012-000106-bgd>

<sup>115</sup> BBC News, "Bangladesh calls off rescue after floods kill 110," 28 June 2012, [www.bbc.co.uk/news/world-asia-18622569](http://www.bbc.co.uk/news/world-asia-18622569)

<sup>116</sup> Ibid.

<sup>117</sup> Syed Zain Al-Mahmood, "Bangladesh farmers caught in vicious cycle of flood and debt," *The Guardian*, 23 August 2012, [www.guardian.co.uk/global-development/2012/aug/23/bangladesh-farmers-cycle-flood-debt](http://www.guardian.co.uk/global-development/2012/aug/23/bangladesh-farmers-cycle-flood-debt)

<sup>118</sup> EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, accessed 20 February 2013, [www.emdat.be](http://www.emdat.be); Xinhua, "236 dead, 101 missing in China floods this year," 18 July 2012, [http://news.xinhuanet.com/english/china/2012-07/18/c\\_123431053.htm](http://news.xinhuanet.com/english/china/2012-07/18/c_123431053.htm)

<sup>119</sup> BBC News, "Deadly Beijing floods prompt infrastructure questions," 23 July 2012, <http://www.bbc.co.uk/news/world-asia-china-18950977>

<sup>120</sup> BBC News, "Beijing floods: Death toll climbs to 77," 26 July 2012, [www.bbc.co.uk/news/world-asia-china-19002080](http://www.bbc.co.uk/news/world-asia-china-19002080)

<sup>121</sup> Jacob Fromer, "An Epic Downpour Wipes Away a Capital's Sheen," *The New York Times*, 26 July 2012, [www.nytimes.com/2012/07/27/world/asia/an-epic-flood-exposes-a-creakier-beijing.html?pagewanted=all&\\_r=0](http://www.nytimes.com/2012/07/27/world/asia/an-epic-flood-exposes-a-creakier-beijing.html?pagewanted=all&_r=0)

<sup>122</sup> BBC News, "Kashmir avalanche: Up to 135 feared dead on Siachen," 8 April 2012, [www.bbc.co.uk/news/world-asia-17647029](http://www.bbc.co.uk/news/world-asia-17647029)

<sup>123</sup> BBC News, "Pakistan declares Siachen avalanche buried dead," 29 May 2012, [www.bbc.co.uk/news/world-asia-18246239](http://www.bbc.co.uk/news/world-asia-18246239)

<sup>124</sup> Ibid.

## Climatological Disasters<sup>125</sup>

While the percentage of climatological disasters in 2012 was down quite significantly in comparison with 2011, some of the most significant disasters were caused by climatological hazards, among them the drought in the Sahel. Other significant events were a cold wave that hit Europe in early 2012, which became the second most deadly disaster of the year and a drought in the US which was the second most costly disaster of 2012. In addition, over 250 people were killed in a cold wave in Peru in June. There were also several severe wildfires, particularly in the United States, some of which we discuss in more detail in Chapter 3.

### Sahel Drought and Food Crisis 2012

In May 2012, the World Bank warned that 17 million people were at risk of starvation due to drought which had begun in 2011, particularly in Mauritania, Mali and Niger.<sup>126</sup> As in the Horn of Africa a year earlier, the impact of the drought (less rainfall) was exacerbated by environmental degradation, political and economic factors (such as high grain prices and a decrease of remittances from workers in Libya) and displacement.<sup>127</sup> But unlike the case of Somalia in 2011, widespread famine was avoided, even in Mali, where the situation worsened over the course of 2012 due to escalating conflict. This was due in large measure to the fact that the rains eventually came and there was a good harvest in 2012, but it is also attributable to the difference in humanitarian response. First, early warning systems worked in the Sahel, with warnings coming out in October 2011 in some places and aid agencies across the region systematically carrying out SMART surveys (a methodology that gives an accurate assessment of the severity of a crisis by analyzing the nutritional status of infants and population mortality rates) every lean season.<sup>128</sup> Donors heeded the early warnings and committed funds early, while in Niger and Chad governments took the lead in responding to nutritional needs.<sup>129</sup> The World Food Programme (WFP) bought food in neighboring countries rather than importing it from outside the region and gave cash to beneficiaries to purchase food.<sup>130</sup> Governments, regional organizations, donors and international agencies expressed their commitment to work together to improve the long-term resilience of the people living in the Sahel. In July 2012, the governments of the Economic Community of West African States (ECOWAS), WFP, the Food and Agriculture

<sup>125</sup> Events caused by long-lived/meso to macro scale processes (in the spectrum from intra-seasonal to multi-decadal climate variability), e. g. extreme temperature, drought, wildfire. See: EM-DAT, "Classification," accessed 25 February 2013, <http://www.emdat.be/classification>

<sup>126</sup> The World Bank, "Drought Worsens in the Sahel Region of Africa – Millions of People at Risk," 31 May 2012, <http://go.worldbank.org/K11FM4JEQ0>

<sup>127</sup> See also: Metro, "Sahel drought in West Africa leading to crisis as millions of lives at risk," 3 August 2012, <http://metro.co.uk/2012/08/03/sahel-drought-in-west-africa-leading-to-crisis-as-millions-of-lives-at-risk-521534/>

<sup>128</sup> IRIN, "Sahel: What went right in the crisis response?," 24 October 2012, [www.irinnews.org/report/96632/SAHEL-What-went-right-in-the-crisis-response](http://www.irinnews.org/report/96632/SAHEL-What-went-right-in-the-crisis-response)

<sup>129</sup> Ibid.

<sup>130</sup> Metro, "Sahel drought in West Africa leading to crisis as millions of lives at risk," 3 August 2012,



Organization (FAO), CILLS (Inter-state Committee to fight drought in the Sahel) and donors launched the Global Alliance for Resilience Initiative (AGIR) to help the populations in the region cope with future shocks partly by focusing more on agriculture. In addition, at the time of writing, the UN was formulating a Sahel resilience strategy.<sup>131</sup>

That being said, the situation in Mali offered parallels with Somalia where conflict intensified the effects of the drought. In early 2012, a rebellion of ethnic Tuareg (Mouvement National de Libération de l'Azawad, or MNLA) spread in northern Mali, seizing northern Mali by April and declaring independence. Accusing the government of failing to deal with the Tuareg threat, military officers staged a coup d'état in March, further destabilizing the political situation. Meanwhile, in May, the Islamist group Ansar Dine and the Tuareg MNLA merged and declared northern Mali an Islamic state, a deal endorsed by al-Qaeda in North Africa. Soon after, Ansar Dine turned on the MNLA and took control of most cities in northern Mali.<sup>132</sup> As in Somalia, large numbers of people were displaced by the deadly combination of poor rainfall and conflict. By the end of the year, some 200,000 Malians were displaced internally and almost 200,000 had fled to neighboring countries.<sup>133</sup> Problems of access and breakdown of government services, especially in northern Mali, made responding to the humanitarian crisis difficult and by September 2012, 560,000 children were at risk of acute malnutrition; 175,000 faced severe or acute malnutrition.<sup>134</sup>

In January 2013, a joint French-Malian military offensive managed to defeat the Islamists in most of northern Mali. The heightened conflict brought additional risks to the Malian population and led to still more displacement. Still, even as fighting in major cities came to an end and the first groups of IDPs and refugees declaring a willingness to return to their homes in Timbuktu, Gao and other cities in northern Mali, the displacement and humanitarian crisis in Mali was far from over. OCHA reported in February that 4.3 million people were still in need of humanitarian assistance.<sup>135</sup> An Oxfam report from January 2013 brought into focus the difficult humanitarian situation facing Malian refugees in neighboring countries.<sup>136</sup> As in Somalia in 2011, the presence of armed groups associated with al-Qaeda in Mali complicated the provision of assistance, but at least in the case of Mali they may have increased international attention to the unfolding crisis.

<sup>131</sup> IRIN, "SAHEL: What went right in the crisis response?" op. cit.

<sup>132</sup> BBC, "Mali profile," updated 29 January 2013, [www.bbc.co.uk/news/world-africa-13881978](http://www.bbc.co.uk/news/world-africa-13881978)

<sup>133</sup> UNHCR, "2013 UNHCR country operations profile - Mali situation (Mali, Niger, Burkina Faso)," accessed 19 February 2013, [www.unhcr.org/pages/49e484e66.html](http://www.unhcr.org/pages/49e484e66.html)

<sup>134</sup> OCHA, "Mali, Complex Emergency Situation Report No. 15," 11 September 2012, <http://reliefweb.int/report/mali/mali-complex-emergency-situation-report-no-15>

<sup>135</sup> UNHCR, "Mali: Refugees still fleeing, internal return prospects mixed," 1 February 2013, [www.unhcr.org/510b90856.html](http://www.unhcr.org/510b90856.html); see also: AlertNet, "Aid agencies call for more Mali funding as fighting exacerbates humanitarian crisis," 8 February 2013, <http://www.trust.org/alertnet/news/aid-agencies-call-for-more-mali-funding-as-fighting-exacerbates-humanitarian-crisis/>

<sup>136</sup> Oxfam, "Mali's Conflict Refugees," Oxfam Briefing Paper 167, 22 January 2013, [www.oxfam.org/en/policy/malis-conflict-refugees](http://www.oxfam.org/en/policy/malis-conflict-refugees)

## Cold Wave in Europe

Polar winds sweeping across Russia engulfed much of Europe in the second half of January and early February 2012, causing temperatures to drop as low as -22 degrees Fahrenheit (-30 degrees Celsius) in parts of eastern Europe and -40 degrees Fahrenheit (-40 degrees Celsius) in northern Europe and Russia. The cold wave was accompanied by heavy snowfall in many countries in southeastern Europe, especially on the Balkan Peninsula, where some areas received between 20 and 40 inches (50 and 100 centimeters) of snow.<sup>137</sup> Snow also fell in several regions that do not typically experience it, including the south of France and northern Italy and Mediterranean islands such as Corsica and Mallorca.<sup>138</sup>

At least 587 deaths have been attributed to the cold wave, with London-based reinsurance broker Aon Benfield attributing more than 824 deaths to the cold wave in central and eastern Europe and estimated \$660 million in economic losses in Serbia alone.<sup>139</sup> The highest numbers of deaths were recorded in Ukraine (112), Romania (86), Poland (82) and Russia (64).<sup>140</sup>

## Drought in US

2012 witnessed a record in the US for the hottest year on record, with temperatures of 3.2 degrees Fahrenheit (1.7 degrees Celsius) above the twentieth century average and 1.0 degrees Fahrenheit (0.55 degrees Celsius) above the previous record in 1998. The year was also the fifteenth driest year on record for the contiguous US. The area of the contiguous US experiencing moderate-to-exceptional drought peaked at 61.8 percent during July. Jeff Masters noted that “this was the largest monthly drought footprint since the Dust Bowl year of 1939.”<sup>141</sup>

Not surprisingly, given these weather conditions, the United States experienced its worst drought in 50 years, with 62 percent of the continental United States experiencing a moderate to exceptional drought, compared to 29 percent in 2011.<sup>142</sup> The drought manifested itself differently across the country. It resulted in some of the poorest corn and wheat crops on record; unusual December wildfires in northern Colorado; record-low water levels in

<sup>137</sup> World Meteorological Organization, “Cold Spell in Asia in Late Winter 2011/2012,” 2012, p. 11, [https://www.wmo.int/pages/mediacentre/news/documents/dwd\\_2012\\_report.pdf](https://www.wmo.int/pages/mediacentre/news/documents/dwd_2012_report.pdf)

<sup>138</sup> Ibid.

<sup>139</sup> EM-DAT, Disaster List, accessed 11 January 2013, [www.emdat.be/disaster-list](http://www.emdat.be/disaster-list); Aon Benfield, “February 2012 Global Catastrophe Recap,” 2012, p. 4, [http://thoughtleadership.aonbenfield.com/ThoughtLeadership/Documents/201202\\_if\\_monthly\\_cat\\_recap\\_february.pdf](http://thoughtleadership.aonbenfield.com/ThoughtLeadership/Documents/201202_if_monthly_cat_recap_february.pdf)

<sup>140</sup> EM-DAT, Disaster List, accessed 11 January 2013, [www.emdat.be/disaster-list](http://www.emdat.be/disaster-list)

<sup>141</sup> Jeff Masters “2012: Warmest and 2<sup>nd</sup> most extreme year in US history,” *Weather Underground*, 8 January 2013, [www.wunderground.com/blog/JeffMasters/article.html?entrynum=2324](http://www.wunderground.com/blog/JeffMasters/article.html?entrynum=2324). US temperature records reach back until 1895.

<sup>142</sup> The New York Times, “Drought (U.S. Drought of 2012),” 7 December 2012, <http://topics.nytimes.com/top/news/science/topics/drought/index.html>

major waterways like the Mississippi River; and rising food prices.<sup>143</sup> The combination of economic losses to the country's agricultural sector and losses stemming from factors such as business interruption have been estimated at \$35 billion.<sup>144</sup> Although by February 2013, rains reduced the area covered by drought to 'only' 56.8 percent of contiguous United States, the fact remains that more than half of the contiguous US was affected by drought.

## Geophysical Disasters

After two consecutive years which saw mega-disasters from geophysical hazards (2010 Haiti earthquake, 2011 Great Japan earthquake and tsunami), 2012 was a relatively quiet year in this respect. The deadliest geophysical disaster was a twin-earthquake in Iran on August 11, killing over 300 persons. Aside from earthquakes in Iran, the Philippines and Guatemala, which we briefly discuss below, there were also deadly earthquakes in June in Afghanistan (killing 73 persons), July in China (killing 81 persons), November in Myanmar (killing 38 persons). In addition, there was a series of quakes in Italy's Emilia Romagna region in May, which killed 24 persons and caused losses of up to \$16 billion.<sup>145</sup> Volcanoes were particularly quiet in 2012, with the eruption of the Fuego volcano in Guatemala the most notable event, leading to the evacuation of 33,000 persons but fortunately causing no fatalities.<sup>146</sup>

### Earthquake in the Philippines

Shortly before noon on 6 February 2012, an earthquake of magnitude 6.7 struck off the coast of the province of Negros Oriental in the Central Visayas region of the Philippines.<sup>147</sup> According to the National Disaster and Risk Reduction Management Council (NDRRMC) in the Philippines, the earthquake affected more than 320,000 people and damaged more than 15,000 houses.<sup>148</sup>

<sup>143</sup> The Economist, "Drying Times," 21 July 2012, [www.economist.com/node/21559381](http://www.economist.com/node/21559381); The New York Times, "Drought (U.S. Drought of 2012)," 7 December 2012, <http://topics.nytimes.com/top/news/science/topics/drought/index.html>

<sup>144</sup> Doyle Rice, "Hurricane Sandy, drought cost U.S. \$ 100 billion," *USA Today*, 25 January 2013, [www.usatoday.com/story/weather/2013/01/24/global-disaster-report-sandy-drought/1862201/](http://www.usatoday.com/story/weather/2013/01/24/global-disaster-report-sandy-drought/1862201/); see also: United States Department of Agriculture, "US Drought 2012: Farm and Food Impacts," last updated 6 February 2013, <http://www.ers.usda.gov/topics/in-the-news/us-drought-2012-farm-and-food-impacts.aspx>

<sup>145</sup> EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, accessed 21 February 2013, [www.emdat.be](http://www.emdat.be); loss data from Munich Re, 2012 *Natural Catastrophe Year in Review*, 3 January 2013; see also: BBC News, "Guatemala Fuego volcano eruption triggers evacuation," 13 September 2012, <http://www.bbc.co.uk/news/world-latin-america-19594481>

<sup>146</sup> BBC News, "Guatemala Fuego volcano eruption triggers evacuation," op. cit.

<sup>147</sup> U.S. Geological Survey, "Magnitude 6.7 Negros-Cebu Region," 2012, accessed 3 January 2013, <http://earthquake.usgs.gov/earthquakes/eqinthenews/2012/usb0007wgq/#details>.

<sup>148</sup> National Disaster and Risk Reduction Management Council, "NDRRMC Update: SitRep No. 22 re. Effects of the 6.9 Earthquake in Negros Oriental," 20 February 2012, accessed 15 January 2013, [www.ndrrmc.gov.ph/attachments/article/439/NDRRMC%20Update%20Sitrep%202012%20on%20Negros%20Earthquake.pdf](http://www.ndrrmc.gov.ph/attachments/article/439/NDRRMC%20Update%20Sitrep%202012%20on%20Negros%20Earthquake.pdf)

## Twin Earthquakes in Iran

Within a timespan of eleven minutes, two powerful earthquakes hit Iran on 11 August 2012. The first, measured by the US Geological Survey at magnitude 6.4, struck 37 miles (60 kilometers) northeast of the city of Tabriz in the East Azerbaijan province in northwest Iran. The second, with a magnitude of 6.3, struck near Varzaghan, just 30 miles (49 kilometers) northeast of Tabriz.<sup>149</sup> The earthquakes affected over 1,000 villages in the area, killed over 300 people and injured over 3,000.<sup>150</sup>

## Earthquake in Guatemala

On the morning of 7 November 2012, a 7.4-magnitude earthquake struck 15 miles (24 kilometers) off the Pacific coastal town of Champerico in Guatemala.<sup>151</sup> The quake registered as Guatemala's strongest in 36 years and was felt over 745 miles (1,200 kilometers) away in Mexico City.<sup>152</sup> At least 52 people died as a result and 73,000 were left without power.<sup>153</sup> The state capital of San Marcos was hit particularly hard and suffered severe structural damage to key buildings including the police station, courthouse and prison.<sup>154</sup>

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<sup>149</sup> Iranian Earthquake Engineering Association (IEEA), "Learning from Earthquakes: The  $M_w$  6.4 and  $M_w$  6.3 Iran Earthquakes of August 11, 2012," EERI Special Earthquake Report, December 2012, [http://eeri.org/cohost/newsletter/December\\_2012/Varzaghan\\_Iran.pdf](http://eeri.org/cohost/newsletter/December_2012/Varzaghan_Iran.pdf)

<sup>150</sup> Yeganeh Torbati, "Two earthquakes in Iran kill 300 and injure 5,000," *Reuters*, 12 August 2012, [www.reuters.com/article/2012/08/12/us-iran-earthquake-idUSBRE87A08N20120812](http://www.reuters.com/article/2012/08/12/us-iran-earthquake-idUSBRE87A08N20120812); see also: Fox News, "Ahmadinejad criticized for leaving Iran soon after quake, as death toll hits 306," 13 August 2012, [www.foxnews.com/world/2012/08/13/series-major-earthquakes-in-northwestern-iran-reportedly-leaves-dozens-dead/#ixzz2LNwX7QXZ](http://www.foxnews.com/world/2012/08/13/series-major-earthquakes-in-northwestern-iran-reportedly-leaves-dozens-dead/#ixzz2LNwX7QXZ) [www.foxnews.com/world/2012/08/13/series-major-earthquakes-in-northwestern-iran-reportedly-leaves-dozens-dead/](http://www.foxnews.com/world/2012/08/13/series-major-earthquakes-in-northwestern-iran-reportedly-leaves-dozens-dead/)

<sup>151</sup> U.S. Geological Service, "Magnitude 7.4 – OFFSHORE GUATEMALA," accessed 21 February 2013, <http://earthquake.usgs.gov/earthquakes/recenteqsww/Quakes/usb000dlwm.php>

<sup>152</sup> Al Jazeera, "Dozens killed in Guatemala earthquake," 8 November 2012, [www.aljazeera.com/news/americas/2012/11/201211805947793553.html](http://www.aljazeera.com/news/americas/2012/11/201211805947793553.html)

<sup>153</sup> BBC News, "Guatemala earthquake: Search for San Marcos missing," 8 November 2012, [www.bbc.co.uk/news/world-latin-america-20256454](http://www.bbc.co.uk/news/world-latin-america-20256454)

<sup>154</sup> Al Jazeera, op. cit.

## SECTION 4

### International Humanitarian Disaster Funding in 2012

In 2012, total international humanitarian funding recorded by OCHA's Financial Tracking Service (FTS)<sup>155</sup> decreased for a second year in a row to \$12.8 billion, following an all-time peak of over \$16 billion in 2010 (see Graph 2).<sup>156</sup> In terms of humanitarian disaster funding, the decrease from 2010's record is evident and more dramatic than the trend in total humanitarian funding. FTS only identifies \$0.38 billion for disaster funding in 2012, which is a steep decline from the over \$6 billion in 2010 and approximately \$1.5 billion in 2011. In both categories, total humanitarian funding and disaster funding, 2012 closely resembles 2009, a year that also did not see any mega-disasters and which also had fairly similar numbers of disaster fatalities as 2012. And while in 2012 disaster damage was more than triple the amount in 2009 (\$160 billion to \$50 billion), most of the damage was due to disasters in the United States which did not request any international assistance.<sup>157</sup>

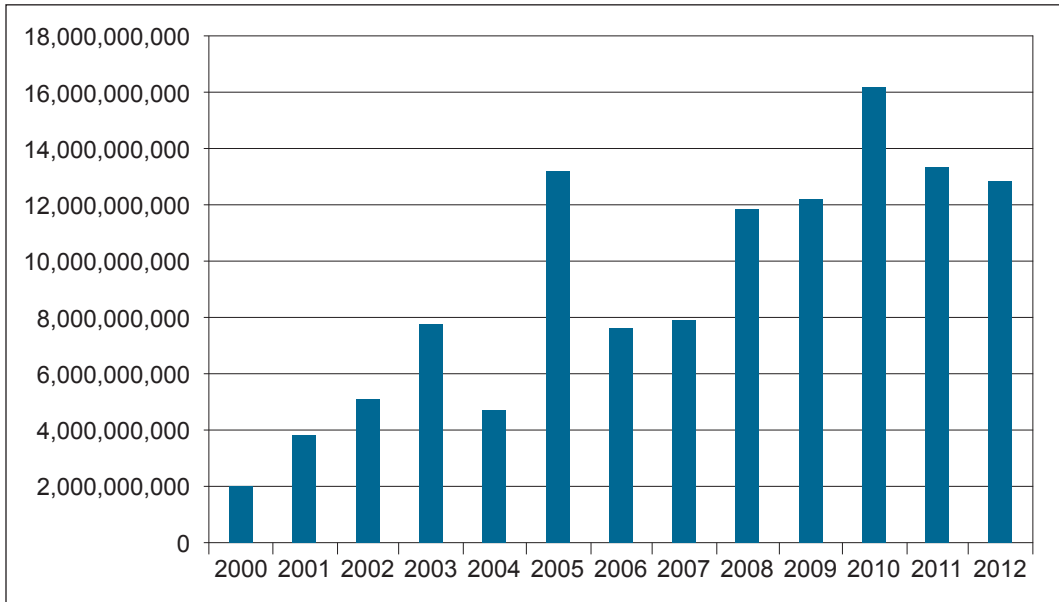
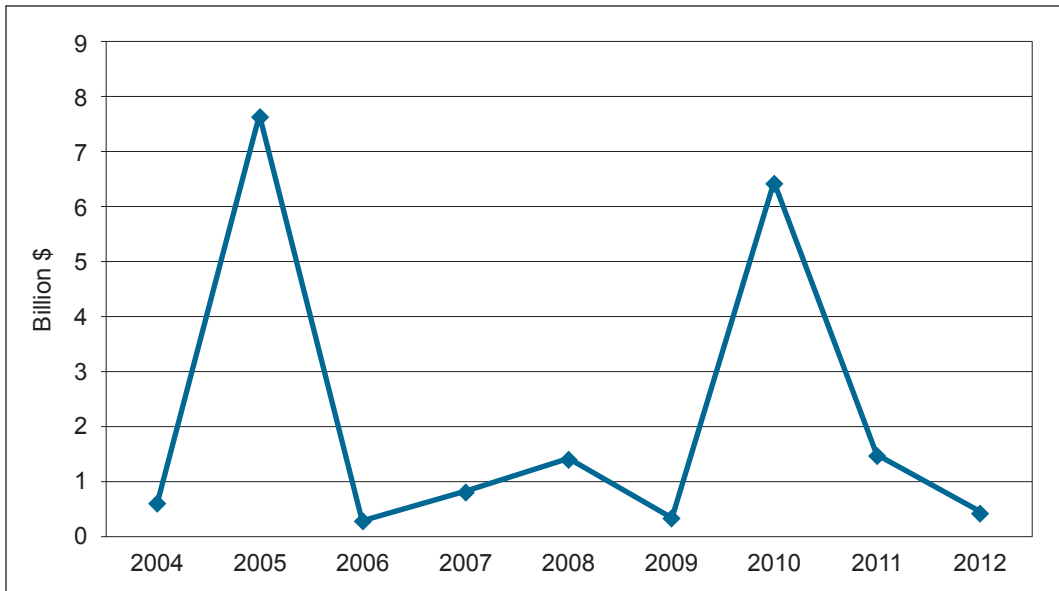
Comparing graphs 2 and 3 (see below) on total humanitarian funding and humanitarian disaster funding over the last several years, it is clear that while overall humanitarian funding demonstrates some variations depending on annual crises, the total has been fairly stable since 2009, hovering at around \$12 billion (with a spike in 2010), after a relatively steady rise from the beginning of the last decade to 2009. Disaster funding, on the other hand, has been crisis-driven, with massive spikes in 2005 (Indian Ocean Tsunami in late 2004) and 2010 (Haiti earthquake, Pakistan floods), caused by mega-disasters affecting developing countries.

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<sup>155</sup> The FTS is a global, real-time database which records all reported international humanitarian aid (including aid to NGOs and the Red Cross/Red Crescent Movement, bilateral aid, in-kind aid and private donations). This includes international funding for responses to conflict, disasters and complex emergencies. FTS features a special focus on consolidated and flash appeals, because they cover the major humanitarian crises and because their funding requirements are well defined, which allows FTS to indicate to what extent populations in crisis receive humanitarian aid in proportion to needs. FTS is managed by the UN Office for Coordination of Humanitarian Affairs (OCHA). All FTS data are provided by donors or recipient organizations. See: <http://fts.unocha.org/pageloader.aspx?page=AboutFTS-uctrl>AboutFTS>

<sup>156</sup> OCHA Financial Tracking Service, "Trend Analysis," accessed 11 February 2013, <http://fts.unocha.org/pageloader.aspx?page=Trend-TrendAnalysis>

<sup>157</sup> Figures from Munich Re, "Few major natural catastrophe losses in 2009: General trend confirmed by large number of weather extremes," 29 December 2009, [www.munichre.com/en/media\\_relations/press\\_releases/2009/2009\\_12\\_29\\_press\\_release.aspx](http://www.munichre.com/en/media_relations/press_releases/2009/2009_12_29_press_release.aspx)

**Graph 2** Total Humanitarian Contributions, 2000-2012<sup>158</sup>**Graph 3** Funding for Humanitarian Responses to Natural Disasters, 2004-2012<sup>159</sup>

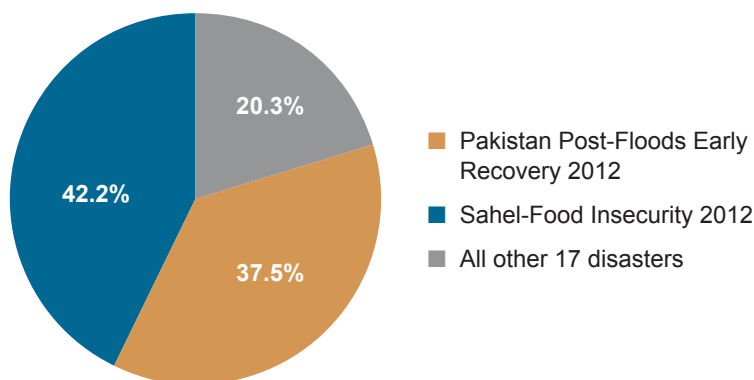
<sup>158</sup> OCHA Financial Tracking Service, "Trend Analysis," accessed 11 February 2013, <http://fts.unocha.org/pageloader.aspx?page=Trend-TrendAnalysis>

<sup>159</sup> OCHA Financial Tracking Service, "Natural Disasters," accessed 1 February 2013, <http://fts.unocha.org/>; 2004-2011 data from Elizabeth Ferris and Daniel Petz, *The Year that Shook the Rich: A Review of Natural Disasters in 2011*, Brookings-LSE Project on Internal Displacement, March 2012.

## CHAPTER 1: THE YEAR OF RECURRING DISASTERS

The two situations receiving the most humanitarian funding for natural disaster response in 2012 were the Pakistan floods and the Sahel drought and food security crisis, which cumulatively received almost 80 percent of humanitarian disaster funding as categorized by FTS (Typhoon Bopha was too late in the year to feature in that funding category<sup>160</sup>).

**Graph 4** International Humanitarian Funding for Natural Disaster Response, 2012<sup>161</sup>



According to FTS data, most international disaster funding in 2012 went to Africa (52.7 percent) and Asia (41.6 percent). The Americas received 4.15 percent and the Pacific 1.47 percent. In comparison, in 2011, over 75 percent of funding went to Asia, 21.5 percent to Africa, 2.27 percent to the Americas and 0.7 percent to the Pacific. No European country received assistance in either year. A list of humanitarian disaster funding for 2012 is provided in Table 4.

**Table 4** Funding for Humanitarian Responses to Natural Disasters, 2012<sup>162</sup>

Country/Region	Disaster	Time	Funding (\$ millions)
<b>Sahel</b>	Food Insecurity	2012	161.7
<b>Pakistan</b>	Post-Floods Early Recovery	2012	143.4
<b>Lesotho</b>	Food Insecurity	2012/13	24.5
<b>Caribbean</b>	Hurricane Sandy	October 2012	15.8
<b>Bangladesh</b>	Floods and Landslides	June 2012	5.9
<b>Comoros</b>	Floods	April 2012	5.9
<b>Mozambique</b>	Tropical Cyclone	January 2012	4.2

*Continues*

<sup>160</sup> On 10 Dec, the Government of the Philippines and the Humanitarian Country Team launched the Bopha Action Plan for Response and Recovery, which was revised on 23 Jan 2013 seeking \$76 million, a 17 percent increase from the \$65 million originally requested. As of 25 Jan, \$27 million has been contributed towards the appeal, leaving a funding gap of \$48 million. See: Reliefweb, "Typhoon Bopha - Dec 2012," accessed 7 March 2013, <http://reliefweb.int/disaster/tc-2012-000197-phl>

<sup>161</sup> OCHA Financial Tracking Service, "Natural Disasters in 2012," accessed 1 February 2013, <http://fts.unocha.org>

<sup>162</sup> OCHA Financial Tracking Service, "Natural Disasters in 2012," report as of 8 February 2013, <http://fts.unocha.org>

Continuation

<b>Table 4 Funding for Humanitarian Responses to Natural Disasters, 2012<sup>162</sup></b>			
<b>Country/Region</b>	<b>Disaster</b>	<b>Time</b>	<b>Funding (\$ millions)</b>
<b>Madagascar</b>	Tropical Cyclone	February 2012	4.1
<b>Korea DPR</b>	Floods	July 2012	3.4
<b>Fiji</b>	Tropical Cyclone	April/December 2012	2.8
<b>Iran</b>	Earthquake	August 2012	2.8
<b>India</b>	Floods	June 2012	2.7
<b>Fiji</b>	Floods	January 2012	1.6
<b>Samoa</b>	Tropical Cyclone	December 2012	1.2
<b>Sri Lanka</b>	Severe Local Storm	March 2012	1.0
<b>Niger</b>	Floods	July 2012	0.8
<b>Malawi</b>	Floods	February 2012	0.7
<b>Philippines</b>	Earthquake	February 2012	0.2
<b>Paraguay</b>	Drought	January 2012	0.1
<b>Total</b>			<b>382.8</b>

It is important to note that the amount that FTS records as humanitarian disaster funding is only a very small part of the overall international humanitarian funding picture. The consolidated and flash appeals in 2012 (see Table 5, below) show, that many of the countries that were major recipients of the over \$5.6 billion raised in appeals, such as countries in the Sahel (in particular Mali), Sudan and South Sudan and Somalia, face a complex array of crises and emergencies, all of which are impacted by environmental factors, in particular drought and desertification.<sup>163</sup> Haiti is also still reeling from the effects of the 2010 earthquake, with over 300,000 people still in IDP camps at the end of 2012 and an ongoing cholera crisis, compounded by drought and destruction from Hurricanes Isaac and Sandy.<sup>164</sup>

<sup>163</sup> The Consolidated Appeal Process (CAP) aims to create a common strategic approach in emergencies by fostering cooperation between donors, NGOs, UN agencies, governments and the International Red Cross and Red Crescent Movement. Donors rely on the CAP for a one-stop overview of humanitarian action, a catalogue of projects to be funded and a system that ensures their funds are spent strategically, efficiently and with greater accountability. When a new disaster is foreseen or occurs, humanitarian and other partners develop a flash appeal within a few days to address urgent needs in the short term. This can be followed by a consolidated appeal if the crisis persists. The process of developing an appeal is a complex one, involving negotiations between various humanitarian actors with differing capacities in the concerned country. In addition to reflecting the overall humanitarian need in the country, appeals are also based on such factors as the capacity of implementing agencies to spend funds effectively and on an assessment of reasonable expectations of the amount likely to be contributed. See: OCHA, "Consolidate Appeal Process," accessed 4 February 2013, [www.unocha.org/cap/about-the-cap/about-process](http://www.unocha.org/cap/about-the-cap/about-process).

<sup>164</sup> CCCM Cluster, "Displacement Tracking Matrix," accessed 12 February 2012, <http://iomhaitidataportal.info/dtm/>



**Table 5 Consolidated and Flash Appeals, 2012<sup>165</sup>**

	<b>Original requirements \$ million</b>	<b>Revised requirements \$ million</b>	<b>Funding \$ million</b>	<b>Percentage of appeal covered</b>
Republic of South Sudan 2012	762.88	1,176.89	797.38	68
Somalia 2012	1,521.93	1,167.74	679.64	58
Sudan 2012	1,064.17	1,051.02	592.57	56
2012+ Kenya Emergency Humanitarian Response Plan	763.76	796.80	573.30	72
Democratic Republic of the Congo 2012	718.56	791.34	565.75	71
Chad 2012	457.37	571.95	354.56	62
Yemen Humanitarian Response Plan 2012	447.14	585.60	344.06	59
Niger 2012	229.15	489.64	312.73	64
occupied Palestinian territory 2012	416.70	419.90	297.71	71
Afghanistan 2012	437.14	448.56	222.02	49
Zimbabwe 2012	268.38	238.45	198.04	83
Mali 2012	213.82	214.56	149.56	70
Cote d'Ivoire 2012	173.09	160.69	98.01	61
Burkina Faso 2012	126.06	126.06	85.55	68
Central African Republic 2012	134.46	124.01	80.40	65
Haiti 2012	230.54	151.08	69.28	46
Mauritania 2012	94.24	92.36	57.30	62
Djibouti Appeal 2012	79.07	79.31	40.22	51
Liberia 2012	121.57	97.92	37.23	38
Philippines Humanitarian Action Plan 2012	66.49	51.23	35.26	69
Lesotho Food Insecurity (9/2012 - 3/ 2013)	38.46	38.46	21.00	55
<b>Total</b>	<b>8,364.98</b>	<b>8,873.57</b>	<b>5,611.57</b>	<b>63</b>

## Pooled Humanitarian Funds in 2012

Pooled humanitarian funds have gained importance as funding vehicles in recent years. Like the Common Humanitarian Funds (CHFs), they can provide aid to populations facing

<sup>165</sup> OCHA, Financial Tracking Service, "Summary of Requirements and Pledges/Contributions by affected country/region," Report as of 11 February 2013, <http://fts.unocha.org/pageloader.aspx?page=emerg-emergencies&section=CE&Year=2012>

complex emergencies or like the Emergency Response Funds (ERFs) they can address unforeseen humanitarian needs.<sup>166</sup> These funds are managed by OCHA. Immediately following a disaster, the United Nations Resident Coordinator or Humanitarian Coordinator (RC/HC) can make a CERF application for humanitarian funding for priority, life-saving activities. In countries where there is an ERF or CHF, the RC/HC can immediately release available funds for agreed priorities at the country level. NGOs cannot access CERF funds directly, but CHFs and ERFs can allocate funds to NGOs. In fact, the majority of ERF and CHF funds are now provided to NGOs.<sup>167</sup>

In 2012, pooled funds dispersed almost \$1 billion, making up more than nine percent of international humanitarian funding received by the 52 countries that benefited from one or more pooled funds. The CERF disbursed over \$477 million, the CHFs over \$368 million and ERFs over \$73 million.<sup>168</sup> For several countries facing natural disasters in 2012 (for example, the Philippines) and countries recovering from disasters (Haiti), contributions from pooled funds made up more than 10 percent of humanitarian funding during 2012. However, the largest recipients of funding from pooled funds were countries facing complex crises, such as the DRC, Sudan, South Sudan and Somalia, which also receive funding through country CHFs.

**Table 6 Pooled Humanitarian Funds, 2012<sup>169</sup>**

Country	Central Emergency Response Fund (CERF)	Common Humanitarian Funds (CHF)	Emergency Response Funds (ERF)	Total pooled fund allocations	Total humanitarian funding received	Pooled funds as % of total funding received
South Sudan	40.04	108.44		148.48	880.16	16.9
DR Congo	31.49	87.87	1.08	120.44	631.00	19.1
Sudan	20.16	76.81		96.97	691.75	14.0
Somalia	0.00	89.27		89.27	866.63	10.3
Ethiopia	13.98		37.76	51.75	660.00	7.8
Syria	36.48		4.97	41.45	426.40	9.7

*Continues*

<sup>166</sup> Common Humanitarian Funds (CHFs) are funds created to provide more flexible and predictable funding in countries that are subject to complex humanitarian emergencies. As of March 2012, there were five CHFs in operation for the Central African Republic, the DRC, Somalia, Sudan and South Sudan. See: Development Initiatives, *Common humanitarian funds (CHFs)*, Global Humanitarian Assistance, March 2012, [www.globalhumanitarianassistance.org](http://www.globalhumanitarianassistance.org). Emergency Response Funds (ERFs) provide rapid and flexible funding to in-country actors to address unforeseen humanitarian needs. For donors that don't have in country presence, the ERF offers a platform through which they can channel their funding. See: Development Initiatives, *Emergency response funds (ERFs)*, Global Humanitarian Assistance, July 2011, [www.globalhumanitarianassistance.org](http://www.globalhumanitarianassistance.org)

<sup>167</sup> OCHA, "Humanitarian Financing – Overview," accessed 11 February 2013, <http://www.unocha.org/what-we-do/humanitarian-financing/overview>

<sup>168</sup> OCHA Financial Tracking Service, "Pooled Funds," accessed 11 February 2013, <http://fts.unocha.org/pageloader.aspx?page=Pooled-SummaryPoolFunds&year=2012>

<sup>169</sup> *Ibid.*

Continuation

**Table 6** Pooled Humanitarian Funds, 2012<sup>169</sup>

Country	Central Emergency Response Fund (CERF)	Common Humanitarian Funds (CHF)	Emergency Response Funds (ERF)	Total pooled fund allocations	Total humanitarian funding received	Pooled funds as % of total funding received
Pakistan	36.74		1.42	38.16	452.69	8.4
Yemen	23.46		6.27	29.74	424.94	7.0
Niger	24.61			24.61	427.28	5.8
Myanmar	16.65		1.21	17.86	122.09	14.6
Burkina Faso	14.87			14.87	145.45	10.2
Chad	14.78			14.78	412.49	3.6
Mali	13.95			13.95	209.03	6.7
Central African Republic	7.99	5.88		13.87	98.69	14.1
Haiti	11.90		1.14	13.04	130.18	10.0
Philippines	13.01			13.01	85.93	15.1
<b>Total (52 countries)</b>	<b>477.34</b>	<b>368.27</b>	<b>70.05</b>	<b>915.67</b>	<b>9,919.90</b>	<b>9.2</b>

As evidenced from this discussion, the international humanitarian funding landscape is a complex system of different funding streams and vehicles. If domestic contributions or remittances were included, the picture would be even more complex.<sup>170</sup>

This chapter has provided an overview of disasters occurring in 2012 with an emphasis on recurring disasters. We suggest that the issue of recurring, continuing and cascading disasters merits much more research as does the intersection of disasters and other kinds of emergencies, such as conflicts and industrial disasters. The next chapter looks at the growing role of regional organizations in responding to disasters.

<sup>170</sup> Recent years have seen the development of comprehensive research reports that focus specifically on these issues. For example, Development Initiatives' *Global Humanitarian Assistance Report* delves deeper into this topic than we can in this publication.