



Global estimates 2011

People displaced by natural hazard-induced disasters

Global estimates 2011

People displaced by natural hazard-induced disasters

June 2012

Contents

Contents 2

List of tables and figures 3

Executive summary 4

1. Introduction. 6

2. About the study. 7

3. The total number of people displaced. 9

4. Displacement by type of disaster 10

5. Displacement by scale 12

6. Displacement by location 14

Annexe Largest displacements by natural hazard-related disasters in 2011 20

Notes. 22

Contributors

Author: Michelle Yonetani
Researcher: Simone Holladay
Editors: Jeremy Lennard and Tim Morris
Maps, design and layout: Rachel Dolores

With thanks to:

Centre for Research on the Epidemiology of Disasters (CRED) Louvain Catholic University, Brussels. Regina Below
Church World Service-Asia/Pacific. Takeshi Komino
International Federation of Red Cross and Red Crescent Societies. Frédéric Zanetta
UN Population Fund (UNFPA), Population and Development Branch. Daniel Schensul
International Organisation for Migration (IOM). Flora Camain
Pacific Disaster Net. Jutta May and Sereima Kaouniviti
UN Office for the Coordination of Humanitarian Affairs (OCHA) Regional Office for the Pacific, Public Information and
Advocacy Office. Kirsten Mildren and Zaw Htet



List of tables and figures

Inside cover

Map: Global displacement by natural hazard-induced disasters, 2011

List of Tables

Table 1: Typology of natural hazard-related disasters included in the study

Table 2: Total number of people displaced (millions), 2008-2011

Table 3: Number of disasters causing displacement vs. number displaced by category and type of hazard, 2011

Table 4: Ten largest disasters in terms of number of people displaced, 2011

Table 5: Number of disasters by scale of displacement and percentage of total displacement caused, 2008-2011

Table 6: Number displaced by scale of disaster (millions), 2008-2011

Table 7: Countries with highest number of people displaced, 2011

Table 8: Ten countries with the highest proportion of overall population displaced, 2011

Table 9: Asia - displacement by sub-region, 2011

Table 10: The Americas - displacement by sub-region, 2011

Table 11: Africa - displacement by sub-region, 2011

Table 12: Africa - ten largest displacements, 2011

List of Figures

Figure 1: Percentage displaced worldwide by category of natural hazard-related disaster, 2011

Figure 2: Total displaced worldwide by climatological disasters, 2009-2011

Figure 3: Proportion displaced by weather vs. geophysical disasters worldwide, 2008-2011

Figure 4: Global displacement by scale of displacement per disaster, 2008-2011

Figure 5: Total displacement by continental region, 2011

Figure 6: Asia - percentage of total displaced and number of disasters causing displacement by category of disaster, 2011

Annexe

Disasters causing the largest-scale displacements in 2011 (all those that displaced over 100,000 people)

Copyright notice: Any part of this text may be reproduced without permission provided that it is reproduced accurately and not in a misleading context, and the source of the material is clearly acknowledged by means of the above title, publishers and date. The wide dissemination, reproduction and use of the document is encouraged. Please forward a copy of any reproductions, translations or quotations to IDMC.

Cover photo: A man looks at his village destroyed by the earthquake and tsunami in Rikuzentakata in Iwate prefecture, northeast Japan, March 2011. (Photo: REUTERS/Toru Hanai)

Designer: Laris(s)a, www.laris-s-a.com

Executive summary

In recent years, governments and other stakeholders have given increased attention to internal displacement associated with the impact of natural hazards such as floods, storms, extreme temperatures, wildfires, earthquakes and volcanoes. Further knowledge and action is needed, however, to better understand and address the multiple risks involved and find sustainable solutions for people displaced by such events. Often referred to as “natural” disasters, they are created by hazards in combination with other drivers of risk and vulnerability. Many of these drivers are, in fact, the result of human action, inaction or lack of capacity to prevent or reduce the impact of such events on exposed populations.

Previous IDMC studies have established the global scale and frequency of disasters that trigger the displacement of millions of people each year. Climate change impacts, such as less predictable monsoons, changing rainfall patterns, significant temperature rises and more intense tropical cyclones, combined with rapid population growth in areas exposed to such hazards, are likely to result in greater displacement in the future. The Cancun Adaptation Framework established at the 2010 United Nations Climate Change Conference specifically recognises the need to address this issue as a core part of adaptation, including through filling data and knowledge gaps.

Displacement often makes pre-existing vulnerabilities worse, creates specific needs for assistance and protection and severely tests the resilience of people forced to leave behind their homes, communities and livelihoods. It has a disproportionate effect on the poorest and most marginalised people worldwide, and also impacts communities and the environment in areas where people take refuge. The vast majority of people displaced by disasters remain within the affected country, and while civil society, the international community and other actors play an important part, governments hold the primary responsibility for protecting and assisting them.

This study presents global estimates for the number of people newly displaced in 2011 by disasters induced by both weather-related and geophysical hazards. Displacement related to slower-onset or gradual processes of environmental degradation such as drought and de-

sertification and their impact on livelihoods and habitat are not included. Data for 2011 is compared with that of the previous three years, and the number of people displaced per country is considered in relation to overall population size. The estimates are based on the cross-checking of reported information from a range of sources including governments, the UN, the International Federation of Red Cross and Red Crescent Societies, the International Organisation for Migration (IOM), the International Disaster Database (EM-DAT), the Dartmouth Flood Observatory, the Asian Disaster Reduction Centre, Pacific Disaster Net, non-governmental and civil society organisations and the media.

The acute threat or impact of disasters triggered by natural hazards forced at least 14.9 million people to flee or leave their homes worldwide in 2011. The global estimate for each year since 2008 has varied widely in accordance with the scale and frequency of “mega-disasters”, defined for the purpose of this study as events which displace more than a million people. Such disasters are relatively rare and hard to predict, but they have a major impact on the global figure. The largest disaster in 2010, for example, displaced 15.2 million people while the largest in 2011 displaced 3.5 million. Both were caused by floods in China.

A relatively small number of large and mega-disasters have been responsible for the majority of displacements over each of the past four years. Less than a quarter of the disasters recorded in 2011 accounted for nearly 90 per cent of the displacement. The ten largest disasters in terms of the number of people displaced were all in Asia, including multiple events in China, the Philippines, Sri Lanka and Japan. The worst were the prolonged flood disasters in China and Thailand, which displaced 3.5 million and 1.5 million people respectively.

Smaller disasters, including recurrent ones and the displacement they cause are under-reported, and their relative invisibility should be a concern for those working in both the humanitarian and development fields. Smaller disasters have the greatest impact on low-income and less resilient households and communities, and recurrent disasters increase vulnerability and the risk of further displacement over time.

Weather-related disasters, mainly floods and storms, displaced 13.8 million people in 2011, or 92% of the global total. Nine of the ten largest disasters to cause displacement in 2011 were hydro-meteorological events, the exception being the Tōhoku earthquake and tsunami in Japan. At 92,100, the number of people displaced by extreme temperatures and wildfires, which are categorised as climatological events, was far smaller but still significantly higher than in recent years.

Summary of global estimates for new displacement, 2008-2011 (millions)

Type of Disaster	2008	2009	2010	2011
Weather	20.3	15.2	38.3	13.8
Geophysical	15.8	1.5	4	1.1
Total	36.1	16.7	42.3	14.9

Geophysical disasters also cause significant displacement each year. In 2011, around 1.1 million people, or eight per cent of the total, were forced from their homes by earthquakes and volcanic eruptions. By far the largest geophysical disaster was the Tōhoku earthquake and tsunami in Japan.

As in previous years, Asia was the worst-affected continent with 13.3 million people displaced, or 89 per cent of the global total. The vast majority were displaced in east, south and south-east Asia, but the figure also includes west Asia where the Van earthquake in Turkey displaced more than 250,000 people, floods in Kazakhstan 16,000 and flash floods in Iraq 2,000. More than a million people were displaced in the Americas, accounting for seven per cent of the global total. Mexico and Brazil had the highest figures. In Africa more than 580,000 people were displaced, accounting for four per cent of the global total. The majority of displacements took place in southern Africa, but with 200,000 displaced by floods, Angola was the worst-affected country. Europe and Oceania each accounted for less than one per cent of the global total.

Displacement was recorded in at least 61 countries, with 15 of them seeing more than 100,000 people displaced. The ten countries with the highest figures accounted for 88 per cent of the global total. Nine of the ten countries were in Asia, the exception being Mexico where major floods and a tropical storm displaced more than 500,000 people.

With nearly 685,000 or three per cent of its people forced from their homes in 2011, Sri Lanka had the highest proportion of its overall population displaced compared to other countries. Large-scale displacements and/or their frequency in the Philippines and Thailand also meant a relatively high proportion of their populations were displaced. China, in contrast, had the highest number of people displaced globally, but this figure accounted for only 0.3 per cent of its 14.5 million population. By this measure, attention is also called to less populous countries such as Bhutan and Namibia, where the comparatively small numbers of people displaced nevertheless accounted for a relatively high proportion of their populations.

These figures give an indication of the global, regional and national scale of the displacement crises, but require further analysis in order to form the basis for policy-making and to inform responses, particularly at the country level. IDMC is developing methodologies that will increase the scope and accuracy of the estimates currently provided. Once they have been tested and peer-reviewed, they will enable better identification of displacement patterns, including for small-scale disasters; displacement associated with slow-onset hazards; displacement over time, including protracted displacements; and the risk and likely magnitude of displacement within a given country or other relevant geographical area.

Through its work, IDMC will continue to call attention to displacement by natural hazard-induced disasters as a humanitarian, development and human rights concern, and to provide an evidence-based reference for decision-makers and advocates. Governments, the international community and civil society must increase their support and collaboration to strengthen the resilience of communities at risk, and become better equipped both to respond to the current reality and prevent future displacement and its impacts.

1. Introduction

Research on displacement for each year since 2008 has established the global scale, types and locations of natural hazards that trigger disasters and the internal displacement of millions of people each year.¹ In recent years, governments and other stakeholders have given increased attention to displacement associated with the impact of floods, storms, extreme temperatures, wildfires, earthquakes and volcanoes, but further knowledge and action is needed to inform policy and responses.

Displacement often makes pre-existing vulnerabilities worse, creates specific needs for assistance and protection and severely tests the resilience of people forced to leave their homes, land, communities, jobs and livelihoods. Displaced people may face other risks, including the loss of access to common property resources, marginalisation, food insecurity, increased morbidity and social disarticulation. This is especially true of those communities and individuals least prepared and most at risk of neglect and discrimination, and for which governments are primarily responsible for protecting and assisting.

The Intergovernmental Panel on Climate Change report *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX)*, concluded

that climate change impacts, including less predictable monsoons, changing rainfall patterns, significant temperature rises and more intense tropical cyclones, combined with rapid population growth in areas exposed to such hazards, are likely to result in greater displacement in future. In some cases, the permanent relocation of populations may become increasingly necessary.²

People's pre-existing vulnerabilities and the capacity of governments and others to prevent disasters and provide protection and assistance will continue to be key in determining people's resilience against disaster impacts, including displacement. To address the risk of displacement and achieve durable solutions, significant advances in disaster management, disaster risk reduction and climate change adaptation are urgently needed. The Cancun Adaptation Framework established at the 2010 United Nations Climate Change Conference calls on parties to enhance their understanding and cooperation in relation to "climate-induced displacement, migration and planned relocation"³. Governments, the international community and civil society must increase their support and collaboration to strengthen the resilience of communities at risk and become better equipped both to respond to the current reality and prevent future displacement and its impacts.



Typhoon Washi survivors rest in a crowded evacuation center in Iligan city, southern Philippines, December 2011. (Photo: REUTERS/Erik De Castro)

2. About the study

IDMC and the UN Office for the Coordination of Humanitarian Affairs (OCHA) produced the first global estimates in 2009, covering displacement caused during the previous year.⁴ The annual undertaking has two main aims: to provide policy-makers and advocates with evidence of the scale of the phenomenon, and to develop methodology for the ongoing monitoring of, and research into, disaster-related displacement.

Methodology and limitations

This study presents global estimates for the number of people newly displaced in 2011, and makes comparisons with findings from 2008, 2009 and 2010. The methodology used maintains the same general scope and approach as previous years⁵ with some adjustments. Estimates of the number of people displaced are provided at the global, regional and national levels; displacement related to a range of weather-related and geophysical hazards are included and disaggregated in the findings (as summarised table 1 and described in section 4); the scale of displacement by country is calculated as a proportion of overall population; and summaries of the findings are provided by region.

To identify the extent of displacement caused, 133 out of 294 disasters that affected at least 3,000 people were investigated, plus an additional sample of smaller disasters. Previous studies investigated only disasters affecting more than 50,000 people, plus a sub-sample of smaller events. Displacement data for 2011 was identified for 135 disasters in 61 countries, and formed the core IDMC Disaster-induced Displacement Dataset (DiDD) for the analysis in this study. Due to the limited availability of data for many disasters and countries, it can be assumed that the global estimates in this study are generally understated. There is a notable lack, for example, of information on smaller disasters and on displaced people outside camps or evacuation centres.

The estimate of the displacement caused by each disaster was reached by collecting, cross-checking and analysing secondary data from a range of sources. These include governments, the UN, the International Federation of Red Cross and Red Crescent Societies, the International Organisation for Migration, Dartmouth

Flood Observatory, the Asian Disaster Reduction Centre, Pacific Disaster Net, non-governmental and civil society organisations, and the media. The International Disaster Database (EM-DAT, managed by the Brussels-based Centre for Research on the Epidemiology of Disasters)⁶ provided the initial list of disasters.

The estimated figure for each disaster was based on the most reliable source of data available while considering other key variables in terms of reported locations and dates to ensure that the figures provided by the source were associated with the correct event. Indications of displacement included references to “displaced”, “evacuated” and “homeless” or houses being damaged or destroyed. To avoid double counting, various proxy figures (such as those for evacuations and homelessness) were not aggregated.

Internally displaced people (IDPs) are defined in the 1998 Guiding Principles on Internal Displacement as “persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence”, and includes people displaced as a result of or in order to avoid the effects of “natural or human-made disasters, and who have not crossed an internationally recognised state border”.⁷ It can be assumed that the vast majority of people displaced by natural hazard-induced disasters are IDPs. The study, however, does not cover their destinations, or how many returned to their original locations, relocated elsewhere or integrated into their places of displacement. As such, it is unable to distinguish between IDPs and those who may have crossed a border.

The study does not cover displacement related to slow-onset disasters and more gradual processes of environmental degradation such as drought and desertification. Nor does it profile how long people were displaced for, whether they have been repeatedly displaced or the number of people living in protracted displacement situations. The dataset does not allow for the global disaggregation of figures by sex and age as indicators of particular vulnerabilities, or for the understanding of impacts in rural and urban areas and at more detailed geographical levels.

Table 1 Typology of natural hazard-related disasters included in the study⁸

■ Highlighted hazards are those included in the IDMC Disaster Induced Displacement Dataset (DiDD) underlying this study.

Weather-related disasters			
	Meteorological	Hydrological	Climatological
Sudden onset	Tropical storms, winter storms, tornados, snow and sand storms	Floods (flash, coastal/storm surges, riverine), wet mass movements (landslides, avalanches, sudden subsidence)	Extreme winter conditions, heat waves, wild fires
Slow onset		Long-lasting subsidence	Drought
Geophysical and biological disasters			
	Geophysical	Biological	
Sudden onset	Earthquakes, volcanic eruptions, dry mass movements (rockfalls, snow and debris avalanches, landslides, sudden subsidence)	Epidemics, insect infestations, animal stampedes	
Slow onset	Long-lasting subsidence	Epidemics, insect infestations	

Next steps

IDMC will continue to publish annual global estimates as evidence of the scale and location of displacement associated with natural hazard-induced disasters, and as a contribution to the knowledge required to inform policy and practice. In order to address knowledge gaps, it is also developing enhanced and new methodologies that will increase understanding of the issue. Once they have been tested and peer-reviewed, they will enable future estimates to better identify patterns of displacement, including for small-scale disasters; displacement over time, including protracted displacement situations; the scale and scope of displacement associated with slow-onset disasters; and the risk and likely magnitude of displacement within a given country or other geographical area. As well as leading to a better understanding of the displacement that has already occurred, new methodologies will help policy-makers prevent and prepare for future events.

What is a “disaster”?

“[A] serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources [...] It results from the combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk.” (UN Office for Disaster Risk Reduction, UNISDR) In this study, the phrase “natural” hazards and disasters is shorthand used in reference to the human impact of weather-related and geophysical hazard events in combination with other drivers of risk and vulnerability, many of which are the result of human action or inaction.

EM-DAT was used for the initial identification of disasters to be investigated. The criteria for “disaster events” entered in the database include at least one of the following: ten or more reported fatalities, at least 100 people reported affected, declaration of a state of emergency, and/or a call by the affected government for international assistance.

3. The total number of people displaced

Disasters triggered by weather-related and geophysical hazards are a major cause of internal displacement worldwide. At least 14.9 million people were newly displaced by such events in 2011.

As table 2 shows, the total number of people displaced is lower than for the preceding three years. The significant disparity between the annual totals is due largely to differences in the scale and frequency of “mega-disasters”, defined for the purpose of this study as those which displaced more than a million people. Large-scale disasters are defined as those displacing more than 100,000 people (further discussed in section 5).

By way of a comparison between the scale of displacement related to natural hazard-induced disasters and

other major causes, IDMC has reported that 3.5 million people worldwide were newly displaced by conflict and generalised violence during the same period. The overall figure, including pre-existing and protracted situations, was 26.4 million.¹⁰ Some of these same IDPs were further displaced or otherwise affected by natural hazards, but their number is unknown. The causes of displacement are often complex and interlinked.

It should be noted that the figure of 14.9 million represents only part of the overall picture. It does not encompass displacement related to habitat loss or food and livelihood insecurity caused by slow-onset disasters or more gradual processes of environmental degradation including drought and desertification (see table 1). It also only covers displacement that took place in 2011. The identification of protracted displacement situations, including global data on people still displaced following disasters in previous years, constitutes an important knowledge gap given the increasing risks displaced people face over time. An understanding of longer-term trends in global internal displacement, including the impacts of climate change, would require data covering a much longer time period and which takes trends in disaster reporting and population growth into account.

Table 2 Total number of people displaced (millions), 2008-2011⁹

Type of disaster	2008	2009	2010	2011
Weather	20.3 (56%)	15.2 (91%)	38.3 (91%)	13.8 (92%)
Geophysical	15.8 (44%)	1.5 (9%)	4 (9%)	1.1 (8%)
Total	36.1	16.7	42.3	14.9



Paramilitary police pull a rescue boat carrying residents to a safer area along a flooded street amid heavy rain brought by tropical storm Nanmadol in Putian, Fujian province, China, September 2011. (Photo: Reuters/China Daily)

4. Displacement by type of disaster

The disasters included in this study are categorised as hydrological, meteorological, climatological and geophysical (see table 1). “Hydrological” refers to events caused by unusually heavy rainfall or the overflow of bodies of water due to strong winds, such as coastal storm surges, and includes their secondary impacts such as landslides; “meteorological” refers to events caused by atmospheric processes that may last from minutes to days, including different types of storms; and “climatological” refers to events related to extreme seasonal temperatures (winter conditions or heat waves) and wildfires. The climatological category is part of the broader group of weather-related disasters, together with hydro-meteorological events. “Geophysical” refers to events originating from solid earth and includes volcanic eruptions and earthquakes, the latter being a trigger for tsunamis.

Displacement by weather-related disasters

Weather-related disasters accounted for 92 per cent of displacement in 2011, and 115 of the 135 disasters studied. They displaced a total of 13.8 million people (see figure 1 and table 3).

Figure 1 Percentage displaced worldwide by category of natural hazard-related disaster, 2011

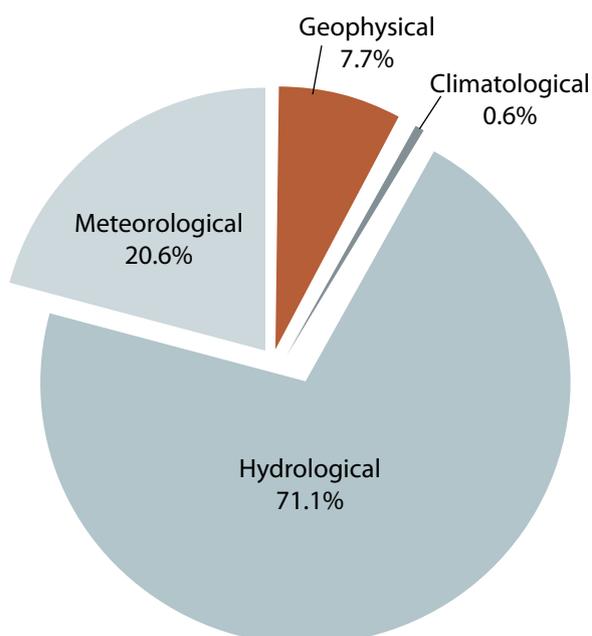


Table 3 Number of disasters causing displacement vs. number displaced by category and type of hazard, 2011

Category	Type of hazard	# Events	# Displaced
Hydrological	Floods	80	10,236,722
	Landslides	3	403,000
Meteorological	Storms	30	3,071,769
Climatological	Wildfires	2	4,300
	Extreme temperature	1	87,800
Geophysical	Earthquakes	16	1,132,278
	Volcanic eruptions	3	11,347
		135	14,947,336

Floods and landslides (hydrological disasters)

Floods and landslides caused the largest displacements reported in 2011, triggered by unusually heavy and prolonged rains in China and Thailand (see section 5, table 4). In Sri Lanka, heavy seasonal rains led to back-to-back floods across North-Central and Eastern provinces in January and February. The first displaced more than 360,000 people and the second around 325,000 people, with 18,000 homes destroyed. Many of those displaced were conflict IDPs whose semi-permanent homes in which they had resettled were destroyed.¹¹

Storms (meteorological disasters)

Storms contributed to the displacement of more than three million people. The Philippines experienced repeated displacements caused by ten typhoons and tropical storms between May and December. The worst, Typhoon Washi (Sendong), struck northern Mindanao in mid-December and displaced more than 441,000 people. Two months later, 214,000 people remained displaced, including 14,000 in evacuation centres.¹² The largest displacement outside Asia was in Mexico, where Tropical Storm Arlene left 280,000 people homeless in Veracruz state in late June.

It is not unusual for a single storm or weather system to cause displacement in more than one country as it de-

velops. Typhoon Pedring (Nesat), for example, displaced 254,000 people in the Philippines in 2011 before hitting Guangxi province in China, where 300,000 people had to be evacuated.

Extreme temperatures and wildfires (climatological disasters)

Just three disasters were identified as having caused displacement in 2011, but they displaced up to three times more people than in the previous years (see figure 2). 92,100 people were displaced by two wild fires that burned homes and property in the US state of Texas. Extreme winter conditions in southern China resulted in a build up of snow and ice which caused the collapse of poorly-constructed homes and led to the evacuation of people, particularly older people, from remote mountain areas.

Displacement by geophysical disasters

Nineteen earthquakes and volcanic eruptions caused the displacement of 1.1 million people, or eight per cent of the global total in 2011. Geophysical disasters caused less displacement overall than weather events. However, as has been seen in recent years, single extreme events, and powerful earthquakes in particular, can cause displacement on a massive scale given their tendency to cause extensive damage to housing, property and infrastructure. For example, in 2008, the Sichuan earthquake alone displaced 15 million people, and accounted for the very high proportion of displacement related to

geophysical disasters that year as compared to others (see in figure 3).

In 2011, the largest displacement by geophysical disaster was caused by the Tōhoku earthquake and tsunami in Japan on 11 March and the ensuing nuclear crisis at the Fukushima power plant. Almost 19,000 people were killed and 492,000¹³ were forced to flee their homes. This includes at least 70,000 evacuated from areas contaminated by radiation, and the evacuation zone may remain uninhabitable for decades. Other areas have been designated too dangerous in terms of the risk of future tsunamis, and displaced residents will be obliged to relocate. A year after the mega-disaster, the Japanese Red Cross reported that more than 344,000 people were still displaced and living in temporary accommodation. Reconstruction is expected to take at least a decade.¹⁴

At least five earthquakes caused displacement in China in 2011, including a series which affected Ynjiang county in Yunnan province in the border area with Myanmar. An earthquake on 1 February displaced 80,000 people, and another on 10 March, the day before the Tōhoku earthquake struck, displaced 130,000 and destroyed more than 18,000 homes. A third on 24 March displaced another 9,000.

Eastern Turkey also experienced a major earthquake disaster in Van on 23 October, which displaced 252,000 people. Three volcanic eruptions - Mount Lokon in Indonesia, Mount Puyehue in Chile and Mount Bulusan in the Philippines - displaced more than 11,000 people between them.

Figure 2 Total displaced worldwide by climatological disasters, 2009-2011

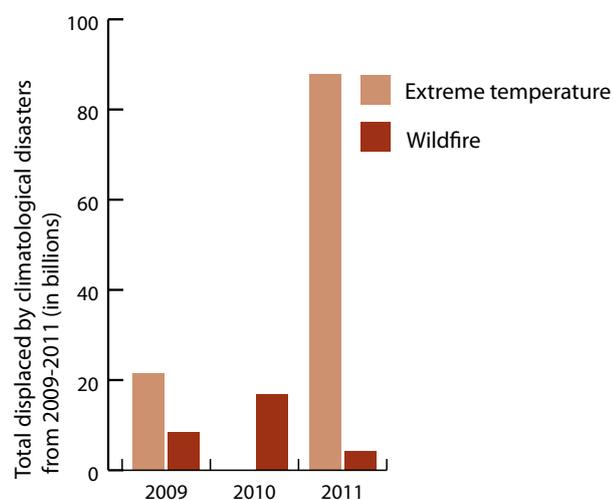
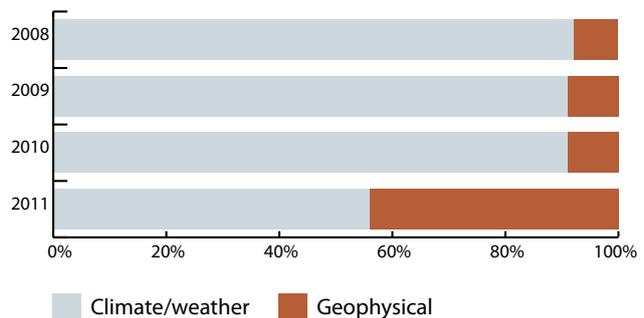


Figure 3 Proportion displaced by climate/weather vs. geophysical disasters worldwide, 2008-2011



5. Displacement by scale

The ten disasters which caused the largest displacements worldwide all occurred in Asia with countries including China, the Philippines, Sri Lanka and Japan appearing more than once. With the exception of the Tōhoku earthquake and tsunami in Japan, all were flood or storm-related disasters, as shown in table 4.

As table 5 shows, large but less frequent events have accounted for most of the displacement during each year studied. In 2011, less than a quarter of the disasters recorded as having caused displacement (32 out of 135) displaced 13.3 million people and accounted for 89 per cent of the global total. Just two mega-disasters accounted for about a third of the total. This contrasts dramatically with 2008, when eight mega-disasters accounted for 79 per cent of displacement; and 2010,

when seven accounted for 80 per cent. The frequency of mega-disasters in 2011 was, however, similar to 2009 and contributed to a similar proportion of total displacement (see table 5, first row).

Displacement caused by mega-disasters varies widely in terms of the number displaced and the frequency of events. They account for the significant disparity in the total number of people displaced globally each year. The largest disaster in 2010, for example, displaced 15.2 million, while the largest in 2011 displaced 3.5 million. Both were caused by floods in China (see table 4). Information on mega-disasters is much more readily available than for smaller events, which distorts the understanding of patterns and trends over longer periods of time.

Table 4 Ten largest disasters in terms of number of people displaced, 2011

Disaster	Country	Month/Period	# Displaced
1. Flood	China	June - September	3,514,000
2. Flood	Thailand	August - December	1,500,000
3. Flood	Philippines	Late January - February	672,131
4. Flood	India	August - October	570,000
5. Japan Tōhoku earthquake and tsunami	Japan	March	492,000
6. Tropical Storm Washi (Sendong)	Philippines	December	441,037
7. Flood	Bangladesh	July	400,000
8. Landslide	Japan	July	400,000
9. Flood	Sri Lanka	January	362,646
10. Typhoon Kabayan (Muifa)	China	August	360,000

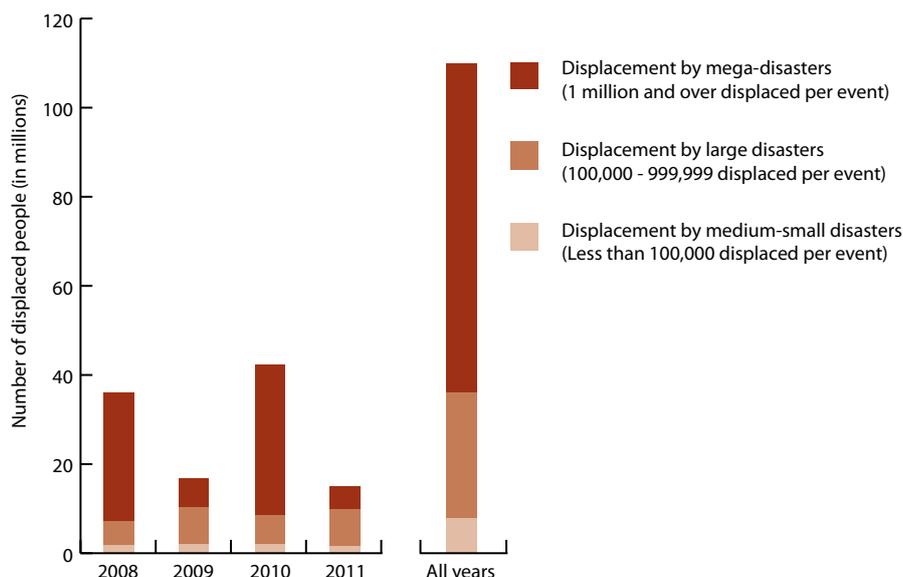
Table 5 Number of disasters by scale of displacement and percentage of total displacement caused, 2008-2011

	2008	2009	2010	2011
Mega-disasters [≥ 1 million displaced/event]	8 events (79%)	3 events (38%)	7 events (80%)	2 events (34%)
Large disasters [≥ 100,000 displaced/event]	25 events (14%)	30 events (50%)	31 events (15%)	30 events (55%)
Medium and smaller disasters [< 100,000]	101 events (5%)	88 events (12%)	115 events (5%)	103 events (11%)

Table 6 Number displaced by scale of disaster (in millions), 2008-2011

	2008	2009	2010	2011
Mega-disasters [≥ 1 million]	28.8	6.4	33.7	5.0
Large disasters [100,000 - 999,999]	5.3	8.3	6.4	8.2
Medium and small disasters [< 100,000]	1.9	2.0	2.2	1.7

Figure 4 Global displacement by scale of displacement per disaster, 2008-2011.



Data challenges for large, complex weather disasters

There are a number of challenges in terms of data quality and availability associated with calculating displacement caused by widespread, complex and evolving disasters over an extended area and period of time. For example, the impacts of an unusually heavy rainy season may be recorded as multiple events or a single disaster. The 2011 floods in China during the June to September rainy season are recorded in the dataset for this report as a single event. The disaster, however, involved bouts of flooding and landslides that affected populations across a huge geographical area over time. It followed a period of severe drought in a number of the same areas and displacement caused by seasonal flooding in previous years. Comprehensive and comparable data is not available for displacement triggered by sub-events within the flooding period, such as landslides, storms and bouts of heavy rain affecting different areas at different times. The figure of 3.5 million is based on reported information, but is likely to be well below the actual number of people who were displaced. They are a best estimate. Similar considerations apply to data for the second largest displacement, caused by Thailand's worst flooding for half a century.

As figure 4 shows, the total number of people displaced by smaller events each year has been far less variable. Such events occur frequently, but they are poorly reported and receive less attention than highly visible, larger events¹⁵. As such, they are significantly under-represented in the dataset for this study. The relative invisibility of smaller disasters, including recurrent ones, should be a concern for those working in both the humanitarian and development fields. Smaller disasters have the greatest impact on low-income households and communities, and recurrent disasters increase vulnerability, poverty and the risk of further displacement over time.

6. Displacement by location

People were displaced in at least 61 countries across the globe. As in previous years, Asia was the continent¹⁶ with the highest number of displaced people, accounting for 89 per cent of the global total. The Americas accounted for seven per cent, Africa four per cent and Europe and Oceania less than one per cent each.

Fifteen countries had the most displacement triggered by natural hazard-induced disasters, with more than 100,000 people newly displaced in 2011. The ten worst-affected countries accounted for 88 per cent of the 14.9 million people displaced worldwide. Nine were in Asia (including Turkey), the exception being Mexico where major floods and a tropical storm disaster displaced more than 500,000 people (see table 7).

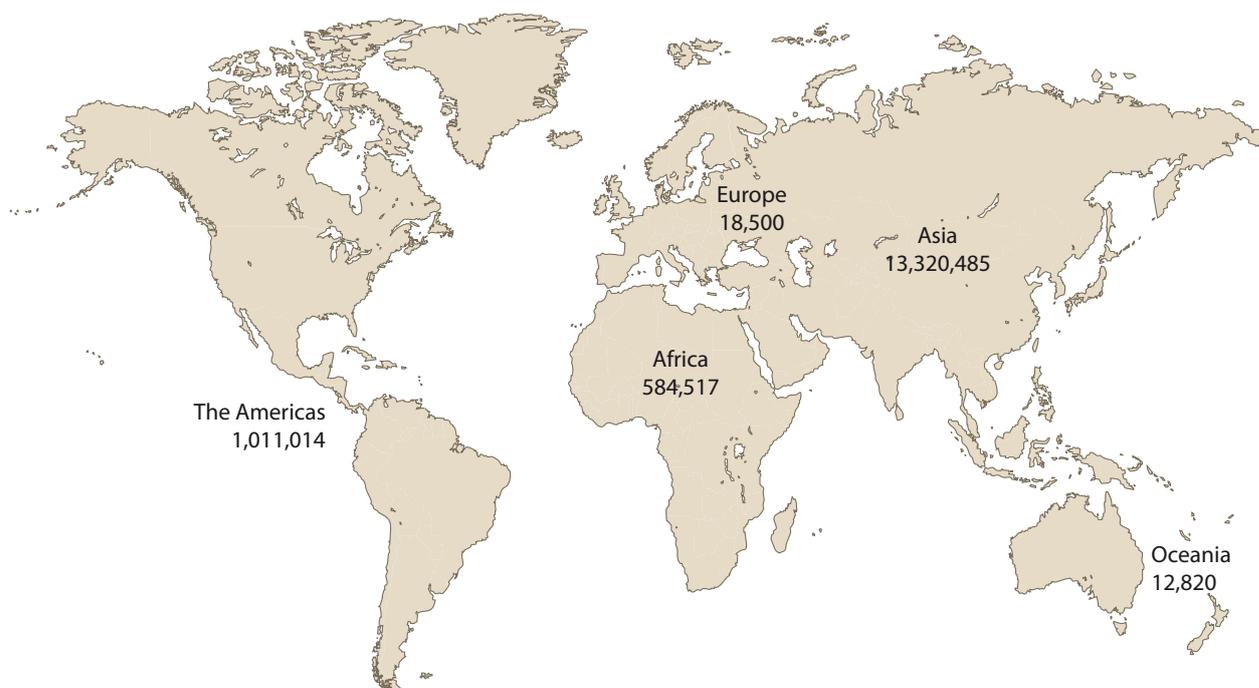
Displacement relative to overall population size provides an additional quantitative lens through which to consider the impact of displacement on affected countries. When compared in this way, the countries rank in a different order (see table 8).

Table 7 Countries with highest number of people displaced, 2011

Country	# Events	# Displaced
1. China	10	4,489,545
2. Philippines	20	2,499,241
3. Thailand	3	1,644,965
4. India	7	1,503,320
5. Japan	2	892,000
6. Sri Lanka	4	689,924
7. Mexico	3	546,795
8. Bangladesh	1	400,000
9. Pakistan	1	300,000
10. Turkey	1	252,000
11. Vietnam	2	230,000
12. Angola	3	227,490
13. Cambodia	1	214,000
14. Brazil	6	169,500
15. Colombia	2	149,000

All countries with at least 100,000 people displaced during the year are listed.

Figure 5 Total displacement by continental region, 2011





People stand near the broken walls of a large dam destroyed by flood waters in Anuradhapura district, north of Colombo, Sri Lanka, February 2011. (Photo: REUTERS/Stringer)

Table 8 Ten countries with the highest proportion of overall population displaced, 2011

Country	Total Displaced	Total Population (2010 UN DESA)	% Displaced / Total population
1. Sri Lanka*	689,924	21,366,799	3.23%
2. Bhutan	20,016	726,000	2.76%
3. Namibia	60,000	2,283,289	2.63%
4. Philippines*	2,499,241	95,287,479	2.62%
5. Thailand*	1,644,965	69,122,234	2.38%
6. Cambodia	214,000	14,369,000	1.49%
7. Angola	227,490	19,673,000	1.16%
8. Lao PDR	50,000	6,201,000	0.81%
9. Japan*	892,000	134,886,830	0.66%
10. Mexico*	546,795	116,396,219	0.47%

* Indicates countries also ranked in the top ten countries with the highest total number of people displaced

Of the ten countries with the highest proportion of their populations displaced, five – Sri Lanka, the Philippines, Thailand, Japan and Mexico – are also among those with the highest displacement numbers. This reflects the huge scale and/or the frequency of the disasters that affected them.

While China had the highest number of people displaced globally, this figure accounted for only 0.3 per cent of its 14.5 million population. In contrast, with nearly 685,000 people displaced from their homes, Sri Lanka had the highest proportion of its population displaced (three per cent). In less populous countries such as Bhutan and Namibia, a comparatively small number of people displaced nevertheless accounted for more than 2.6 per cent of the population.

These figures give an indication of the global, regional and national scale of the crises of displacement but requires further analysis to form the basis for policy-making and to inform responses, particularly at the country level. Further information is required to better understand the implications of the scale of displacement on the capacity of authorities to protect affected populations and provide for their likely needs, including local analysis of the number, location and situations of people exposed to a disaster within a given administrative area. This is outside the scope of this report, but will form part of future analyses.

2011 Regional Summaries

Asia

- The highest numbers of people displaced globally (13.3 million) and by country (table 7), and the biggest mass displacements (table 4) all took place in Asia
- Highest number of people displaced in east Asia, followed by south-east Asia and south Asia. The highest frequency of displacement occurred in south-east Asia
- **South-east Asia:** The Philippines suffered from the most frequent displacements, with at least 20 events including floods, storms and a volcanic eruption displacing 2.5 million people during the year. Elsewhere in south-east Asia, flash floods, a longer period of heavy rains and floods and Tropical Storm Juaning (Nock-Ten) displaced 1.6 million in Thailand and 214,000 people were displaced by floods in Cambodia. Tropical Storm Juaning (Nock-Ten) also hit Laos where 50,000 were displaced. Other countries affected on a smaller-scale include Vietnam (floods), Myanmar (earthquake and floods), Malaysia (flood) and Indonesia (volcano, floods and an earthquake/tsunami)
- **East Asia:** China was the country with the highest number of people displaced (4.5 million), including earthquakes, storms and the largest mass displacement by a weather-related disaster (3.5 million displaced by monsoon floods)
- Japan was the most affected by geophysical disasters with the Tōhoku earthquake and tsunami displacing 492,000 people. In east Asia, there were also 25,000 people displaced by Typhoon Kabayan (Muifa) and ensuing floods, and 6,000 displaced by smaller-scale floods in South Korea
- **South Asia:** Sri Lanka had the highest proportion of its population displaced (3.2% or 685,000 people) by back-to-back flood disasters. Though on a smaller-scale, a relatively high proportion of Bhutan's population was also displaced by an earthquake disaster (2.8%, or 20,000 people). India had the highest number of people displaced in south Asia by six floods and Cyclone Thane (1.5 million). Floods displaced 400,000 in Bangladesh in July and 300,000 were displaced in southern Pakistan, including areas affected by the mega flood disaster of 2010. In addition, 46,000 were displaced by an earthquake in Nepal and in north-west Afghanistan 3,000 people were displaced by floods due to snow-melt
- **West Asia:** The major earthquake disaster in the Van area of Turkey displaced 252,000. Thirty-five hours of incessant rains in Iraq led to flash floods across several governorates of Iraq, leaving 2,000 people homeless

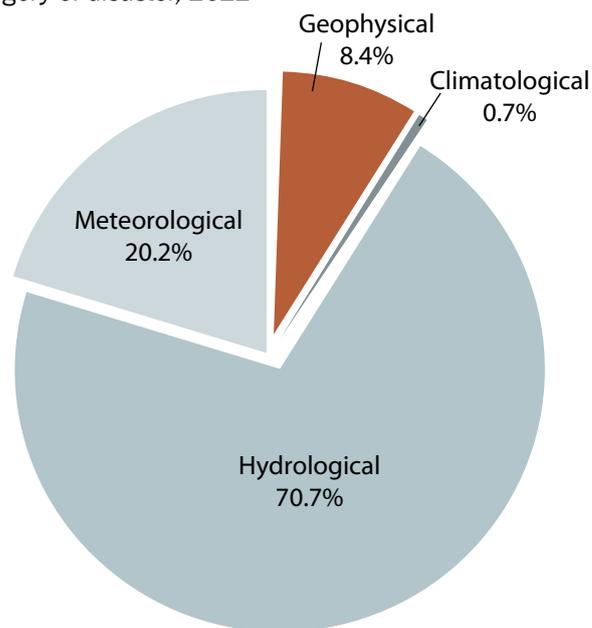
Table 9 Asia - displacement by sub-region, 2011

Sub Region	# Events	# Displaced	% of total displaced in Asia
East Asia	15	5,412,085	41%
South-east Asia	34	4,682,800	35%
South Asia*	16	2,962,600	22%
West Asia**	2	254,000	2%
Central Asia	1	9,000	0.07%
Total	68	13,320,485	

* including Afghanistan

** including Turkey, Middle East and the Caucasus

Figure 6 Asia: Percentage of total displaced and number of disasters causing displacement by category of disaster, 2011



Europe

- The most serious earthquake to hit Spain in about 50 years displaced 15,000 people with the destruction of homes and infrastructure in the southern town of Lorca
- Russia was affected by two smaller-scale floods disasters which displaced 2,500 people in Chechnya, and around 1,000 people in Dagestan



Oceania

- Oceania is one of the most disaster-prone regions in the world in terms of the recurrence, severity and variety of hazards. Based on available data, including data on displacement, the impact of disasters appears low, but the Pacific countries rank among the highest in terms of the number of people affected per 100,000¹⁷.
- Smaller-scale disasters, are under-reported worldwide, including in the Small Island Developing States in Oceania. For example, Vanuatu, in the Melanesia sub-region, was hit by three successive tropical cyclones in just over a month at the beginning of the year, the largest being Cyclone Vania. Displacement data, however, was identified for Tropical Cyclone Atu only (around 400 people displaced). The impact of these cyclones on the communities affected came on top of a drought, a volcanic eruption and a tsunami disaster that had affected the southern Tafea province in the previous 12 months¹⁸
- In Australia, Cyclone Yasi displaced 10,000 people, accounting for 90 per cent of the total figure for displacement in the region. Earthquakes in New Zealand devastated the city of Christchurch and displaced more than 2,000 people. In Tonga, Cyclone Wilma displaced at least 100 people on the Ha'apai Islands



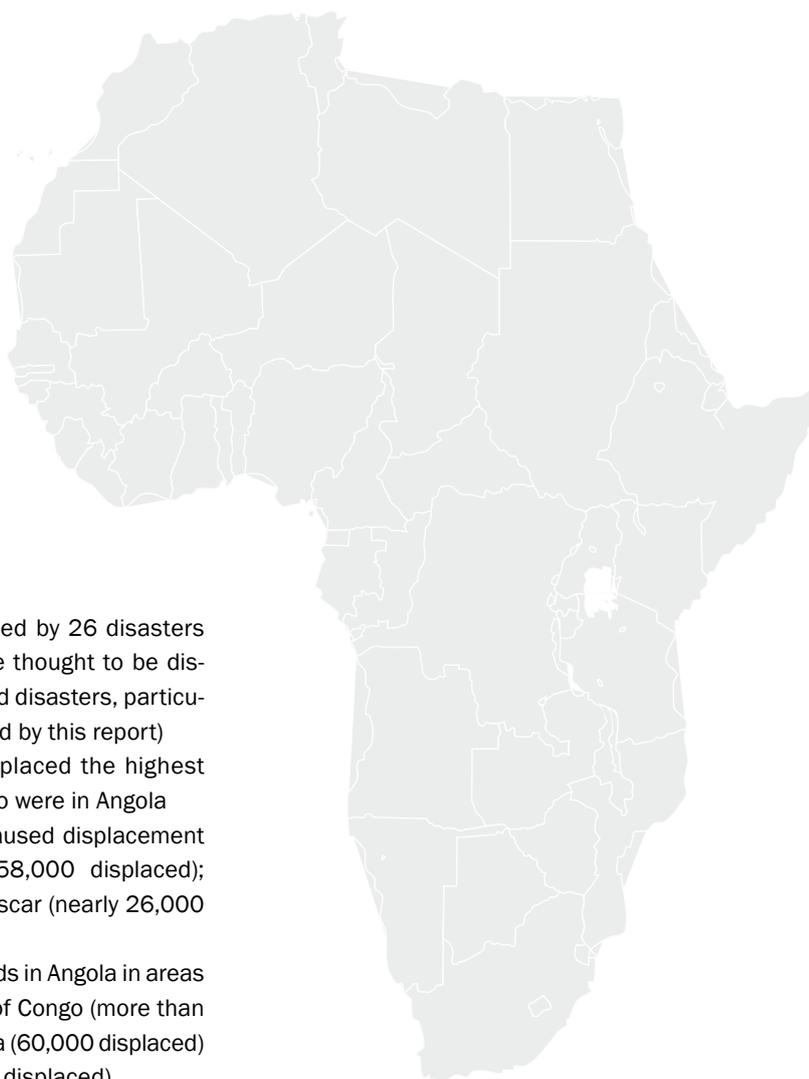


The Americas

- More than a million people displaced
- Twenty-nine of 33 displacement events were floods, landslides and storms; smaller displacements of less than 4,500 people by a volcanic eruption, a wildfire and an earthquake
- Three largest displacements: two disasters in Mexico (floods in Chiapas and Tabasco states and Tropical Storm Arlene in Veracruz state, 250,000 displaced each) and floods in Brazil (100,000 displaced)
- **South America:** in addition to the Brazil floods, two floods in Colombia (as many as 80,000 displaced by each); smaller-scale floods in Peru and Bolivia; eruption of Mount Puyehue in Chile (4,000 displaced)
- **Central America:** in addition to events in Mexico, floods in Guatemala (more than 28,000 displaced) and on a smaller scale in Honduras, Nicaragua, El Salvador and Costa Rica
- **Caribbean:** Around 1,300 people displaced in the Dominican Republic by Tropical Storm Emily and Hurricane Irene
- **North America:** Hurricane Irene on the east US coast (more than 25,000 displaced) and tornados in southern US (around 5,000 displaced)

Table 10 *The Americas - displacement by sub-region, 2011*

Sub Regions	# Events	# Displaced
Central America	9	605,046
South America	13	336,247
The Caribbean	6	18,267
North America	5	51,454
Total	33	1,011,014



Africa

- More than 584,000 people displaced by 26 disasters across four sub-regions; many more thought to be displaced by slow-onset, drought-related disasters, particularly in the Horn of Africa (not covered by this report)
- Five of the ten disasters which displaced the highest numbers were in southern Africa; two were in Angola
- All but one of 26 disasters which caused displacement were related to floods (more than 558,000 displaced); Tropical Cyclone Bringiza in Madagascar (nearly 26,000 displaced)
- Largest displacement caused by floods in Angola in areas bordering the Democratic Republic of Congo (more than 200,000 displaced); floods in Namibia (60,000 displaced) and South Africa (more than 52,000 displaced)

Table 11 Africa - displacement by sub-region, 2011

Sub Regions	# Events	# Displaced
Southern Africa	3	115,532
Eastern Africa	9	121,940
Western Africa	9	107,955
Middle Africa	5	239,090
Total	26	584,517

Table 12 Africa - ten largest displacements, 2011

Country	Disaster	# Displaced
1. Angola	Flood	204,000
2. Namibia	Flood	60,000
3. South Africa	Flood	52,172
4. Ghana	Flood	32,000
5. Niger	Flood	28,175
6. Madagascar	Tropical cyclone Bingiza	25,845
7. Malawi	Flood	24,790
8. Angola	Flood	22,000
9. Mozambique	Flood	22,000
10. Mali	Flood	18,340

Annexe

Largest displacements by natural hazard-related disasters in 2011

The following table shows the summary data for the 31 largest displacements in 2011. They were all estimated to have displaced at least 100,000 people. They are listed in descending order by the number of people estimated to have been displaced. For access to the full data set for 2011, please contact IDMC at idmc@nrc.ch.

Disasters causing the largest scale displacements in 2011 (all disasters that displaced over 100,000 people)

Country	Disaster	Month/Period	Estimated Displaced	Main Source	Notes
China	Floods	June - September	3,514,000	IFRC/DMIS	Original figure from China Ministry of Civil Affairs. Series of flood events.
Thailand	Floods	August - January	1,500,000	Media: Euronews	Bangkok evacuation figure. Series of flood events.
Philippines	Floods	Late January - February	672,131	UN OCHA	
India	Assam Floods	Mid August - early October	570,000	Media: lumdung-assam.blog	Associated with opening of dam floodgates
Japan	Tōhoku Earthquake and Tsunami	March	492,000	UN OCHA	Evacuated figure (includes over 70,000 evacuated from nuclear exclusion zone)
Philippines	Tropical Storm Washi (Sendong)	December	441,037	NDRRMC	
Bangladesh	Flood	July	400,000	IFRC/DMIS	Original government figure
Japan	Mass Movement Wet/Landslides	July	400,000	Media: Xinhua	Evacuated figure
Sri Lanka	Flood	January	362,646	UN Flash Appeal	
China	Typhoon Kabayan (Muifa)	August	360,000	ADRC/Glide	Evacuated figure
Sri Lanka	Flood	February	325,448	IOM	
Pakistan	Flood	August - November	300,000	IFRC Emergency Appeal Operations Update	Original figure from Pakistan National Disaster Management Authority
China	Typhoon Pedring (Nestat)	Late September - October	300,000	Hong Kong Red Cross	Evacuated figure. Operational Update
India	Odisha floods	Late September - late October	280,320	IFRC/Operational Update	Evacuated figure
Mexico	Storm	June - July	280,000	CRED/EM-DAT, UN OCHA	Homeless figure
Mexico	Tropical Storm Arlene	October	261,000	MEDIA: World Socialist website	
Turkey	Van earthquake	October	252,000	IFRC	Preliminary Emergency Appeal

Country	Disaster	Month/Period	Estimated Displaced	Main Source	Notes
India	Cyclone Thane	December	250,000	CRED/EM-DAT	
Philippines	Typhoon Mina (Nanmadol)	August	227,446	NDRRMC	Evacuated figure
Philippines	Typhoon Chedeng (Songda)	May	225,694	NDRRMC	Evacuated figure
Cambodia	Flood	August - November	214,000	NCDM	
Philippines	Tropical Storm Meari (Falcon)	June	212,655	Media: Xinhua	Evacuated figure
Angola	Flood	December	204,000	UN OCHA	
Vietnam	Flood	September - October	200,000	Media: en.baomoi.com	Evacuated figure
India	West Bengal floods	August - mid September	190,000	DREF/IFRC	
Philippines	Typhoon Pedring (Nesat)	September	168,000	DMIS/IFRC	Original figure from ogvernment/NDRRMC
Philippines	Tropical storm Juaning (Nock-ten)	July	150,952	NDRRMC	Evacuated figure
Philippines	Typhoon Quiel (Nalgae)	October	143,703	NDRRMC	Evacuated figure
India	Odisha floods	Early - mid September	130,000	Media: BBC news	Evacuated figure
China	Yunnan earthquake	March	130,000	UN OCHA	
Brazil	Flood	January	100,000	OFDA Disaster Declaration	

Acronyms

ADRC/ GLIDE	Asian Disaster Reduction Council / Global Identifier Number
BBC	British Broadcasting Corporation
CNN	Cable News Network
CRED/ EMDAT	EM-DAT: The OFDA/CRED International Disaster Database, www.emdat.be, Université Catholique de Louvain, Belgium
DREF	Disaster Relief Emergency Fund (IFRC)
DMIS	Disaster Management Information System (IFRC)
IFRC	International Federation of Red Cross and Red Crescent Societies
IOM	International Organization for Migration
NCDM	Kingdom of Cambodia National Committee for Disaster Management
NDRRMC	The Republic of the Phillipenes National Disaster Management and Risk Council
OFDA	The United States Office of Federal Disaster Assistance
UN OCHA	United Nations Office for the Coordination of Humanitarian Affairs
USGS	The United States Geological Survey

Notes

- 1 IDMC/NRC and UNOCHA, 2009. *Monitoring disaster displacement in the context of climate change* and IDMC/NRC, 2011. *Displacement due to natural hazard-induced disasters: Global estimates for 2009 and 2010*.
- 2 IPCC, 2012. *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change* (Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)). Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 pp.
- 3 UNFCCC Cancun Adaptation Framework, paragraph 14(f). "Measures to enhance understanding, coordination and cooperation with regard to climate change induced displacement, migration and planned relocation, where appropriate, at the national, regional and international levels"
- 4 Ibid 1
- 5 See IDMC/NRC, 2011. *Displacement due to natural hazard-induced disasters: Global estimates for 2009 and 2010*, pp. 17-18 and 21-22
- 6 EM-DAT: The OFDA/CRED International Disaster Database, www.emdat.de, Université Catholique de Louvain, Brussels, Belgium.
- 7 *Guiding Principles on Internal Displacement*, United Nations, 1998.
- 8 Adapted from the general classification of natural hazard events developed by CRED in agreement with the reinsurance company Munich Re. Below R., Wirtz A., Guha-Sapir D., *Disaster Category Classification and Peril Terminology For Operational Purposes*, 2009
- 9 Figures of more than a million are rounded to the nearest 100,000. Percentages are rounded to one decimal point.
- 10 IDMC. *The Global Overview 2011: People internally displaced by conflict and violence*.
- 11 UN OCHA Sri Lanka: *Monsoon Flood - Situation Report No. 15*, 25 February 2011.
- 12 UN OCHA Philippines: *Tropical Storm Washi - Situation Report No. 18*, 17 February 2012.
- 13 UN OCHA Japan: *Earthquake and Tsunami - Situation Report No. 16*, 1 April 2011.
- 14 Japanese Red Cross Society. *Japan earthquake and tsunami Operations Update: 11 March 2011 - 26 April 2012*. 27 April 2012.
- 15 UN ISDR *Global Assessment Report on Disaster Risk Reduction 2011*, Chapter 2, *Revealing Risk*
- 16 The composition of macro geographical (continental) regions and sub-regions mirrors that used by the United Nations Statistics Division.
- 17 Ibid 6
- 18 UN OCHA Vanuatu: *Tropical Cyclone Vania - Situation Report No. 2*, 3 February 2011.

The Internal Displacement Monitoring Centre

The Internal Displacement Monitoring Centre (IDMC) was established by the Norwegian Refugee Council in 1998, on the request of the Inter-Agency Standing Committee to set up a global database on internal displacement. 14 years later, IDMC remains the leading source of information and analysis on internal displacement caused by armed conflict, generalised violence and violations of human rights worldwide. Since 2009, IDMC has also monitored displacement due to disasters associated with natural hazards.

IDMC aims to support better international and national responses to situations of internal displacement and respect for the rights of internally displaced people (IDPs), many of whom are among the world's most vulnerable people. It also aims to promote durable solutions for IDPs, through return, local integration or settlement elsewhere in the country.

IDMC's main activities include:

- Monitoring and reporting on internal displacement;
- Researching, analysing and advocating for the rights of IDPs;
- Providing training on the protection of IDPs;
- Contributing to the development of guides and standards on protecting and assisting IDPs.

Internal Displacement Monitoring Centre
Norwegian Refugee Council
Chemin de Balxert 7-9
CH-1219 Châtelaine (Geneva) Switzerland
www.internal-displacement.org