A YEAR OF LIVING DANGEROUSLY
A REVIEW OF NATURAL DISASTERS IN 2010

The Brookings Institution –
London School of Economics
Project on Internal Displacement

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Front: The Haitian national palace, © United Nations Development Programme.

Back: Right/ Eruption of Eyjafjallajökull volcano in Iceland, © iStockphoto;
Left: Young Haitian injured by the earthquake, © United Nations Development Programme.

BROOKINGS

A YEAR OF LIVING DANGEROUSLY: A REVIEW OF NATURAL DISASTERS IN 2010

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Photo: NASA

Hurricane Paula, 2010.

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Photo: © Stockbyte

Tube Well stranded by rising flood water on Beel Dakatia near Khulna, Bangladesh.

ACRONYMS

BNPB	Badan Nasional Penanggulangan Bencana (National Disaster Management Agency – Indonesia)
BPN	Badan Pertanahan Nasional (Land Title Office – Indonesia)
BRR	Badan Rehabilitasi dan Rekonstruksi (Rehabilitation and Reconstruction Agency – Indonesia)
CAP	Consolidated Appeal Process
CDBG	Community Development Block Grant
CERF	Central Emergency Response Fund
COHRE	Center on Human Rights and Evictions
CRED	Centre for Research on the Epidemiology of Disasters
DRR	Disaster Risk Reduction
EHAP	Emergency Humanitarian Action Plan
EM-DAT	Emergency Database (International Disaster Database)
EQC	Earthquake Commission
FATA	Federally Administered Tribal Areas
FEMA	Federal Emergency Management Agency
HANO	Housing Authority of New Orleans
HUD	United States Department of Housing and Urban Development
IASC	Inter-Agency Standing Committee

IATA	International Air Transport Association
IDMC	Internal Displacement Monitoring Centre
IDP	Internally Displaced Person
IFRC	International Federation of Red Cross and Red Crescent Societies
LRA	Louisiana Recovery Authority
MINUSTAH	United Nations Stabilization Mission in Haiti
NGO	Non-governmental Organization
OAS	Organization of American States
OECD	Organisation for Economic Co-operation and Development
OFDA	Office of Foreign Disaster Assistance (USAID)
RALAS	Reconstruction of Aceh's Land Administration System
UNDP	United Nations Development Programme
UNHCR	Office of the United Nations High Commissioner for Refugees
UN OCHA	United Nations Organization for the Coordination of Humanitarian Affairs
USAID	United States Agency for International Development
VEI	Volcano Explosivity Index
VAAC	Volcanic Ash Advisory Centre

FOREWORD

It is with great pleasure that I introduce this new report, *A Year of Living Dangerously: A Review of Natural Disasters in 2010* by the Brookings-LSE Project on Internal Displacement. Since the 2004 tsunami, the Project has played a leading role in highlighting the human rights of communities affected by natural disasters and this report is intended to deepen understanding of current trends in both disasters and the international disaster response.

As the Special Rapporteur on the Human Rights of Internally Displaced Persons, I have seen first-hand the devastating consequences of disasters. The lived experiences of those displaced by conflicts and natural disasters are similar: loss and separation of family members; loss of housing, property, documentation and social support networks; and too often, inadequate responses by national authorities and international humanitarian agencies. Natural disasters tend to affect the poor and marginalized disproportionately and usually exacerbate existing inequalities. As this report points out, there are also inequities in the way the international system responds to disasters.

This *Review* provides both a general overview of natural disasters occurring last year and of the international humanitarian community's response to them. It also delves more deeply into the two so-called mega-disasters of the year, the earthquake in Haiti and the widespread flooding in Pakistan. Finally it offers short analyses of one thematic issue—the "renters' dilemma"—and explores the human rights issues around one particular type of disaster: volcanoes. We hope that this review is the first in a series of annual reports on natural disasters; future issues will explore further thematic issues and other types of disasters.

Over the past decade, there has been increased awareness of the human rights dimension of natural disaster response. Notably the adoption of *Operational Guidelines for the Protection of Persons Affected by Natural Disasters* by the Inter-Agency Standing Committee offers concrete guidance to agencies involved in disaster response. The revision of those *Guidelines* last year further strengthens this guidance by, among other things, highlighting the need to adopt disaster risk reduction strategies which take human rights issues into consideration.

While there is a lot of debate about the impact of climate change on displacement, most experts agree that climate change is likely to increase both the frequency and the intensity of natural disasters. Thus, it is more important than ever that we understand trends and identify shortcomings in the international community's present approach to both natural disaster risk reduction and disaster response. It is through better understanding of these trends that more effective policies will be designed to address the needs and uphold the rights of communities when natural disasters occur.

—Chaloka Beyani
UN Special Rapporteur on the Human Rights of Internally Displaced Persons

http://www.flickr.com/photos/unitednationsdevelopmentprogramme/4274634444/in/set-72157623209524550

Photo: © United Nations Development Programme

Tent city in the aftermath of the Haiti earthquake.

INTRODUCTION*

Almost 300 million people were affected by natural disasters in 2010. The large disasters provided constant headlines throughout the year, beginning with the devastating earthquake in Haiti followed one month later by the even more severe—but far less deadly—earthquake in Chile. In the spring, ash spewing from volcano Eyjafjallajökull in Iceland paralyzed flights for weeks in the northern hemisphere. Early summer witnessed the worst Russian wildfires in history while a few months later, the steadily rising floodwaters in Pakistan covered 20 percent of the country. In sum, it was a terrible year in terms of natural disasters causing havoc and destruction around the globe. However, many of the largest disasters barely made headlines in the Western press.

Most notably, over 130 million Chinese were affected by the worst flooding in recent history—this is more than five times the number of people affected by the earthquake in Haiti and the Pakistani floods combined—but the Chinese floods received far less international attention than either Pakistan or Haiti. The example of the Chinese floods illustrates one of the dilemmas in response to natural disasters, which is that disasters, even major ones, receive significantly diverging media coverage. In the case of China, although over 130 million people were affected and some 4,000 were reported killed or missing,[1] very little international assistance was provided or requested. There was no overall United Nation funding appeal for those affected. The widely-regarded web-portal Reliefweb posted only 243 entries on the Chinese floods, primarily from the Chinese News Agency, in comparison with 10 times that number of entries on the flooding in Pakistan which occurred several months later in the year and affected around 20 million people.

Apart from the few large—or what some even call mega-disasters—like the Haiti earthquake and the floods in China and Pakistan, the majority of disasters in 2010 were "smaller" disasters. Those disasters, smaller in scope and scale, from the Philippines to Guatemala and from Niger to Venezuela, are also deadly, causing significant human suffering and displacement and had economic, social, and in some instances, political consequences.

Defining natural disasters

"The consequences of events triggered by natural hazards that overwhelm local response capacity and seriously affect the social and economic development of a region."[2]

*The authors thank Chareen Stark, Suzanne Saleeby, and Bryce Campbell for their valuable assistance with this publication.

[1] Xinhua News Agency, "Over 4,000 Chinese Dead or Missing in Floods this Year: Govt.", 7 December 2010

[2] Brookings-Bern Project on Internal Displacement, *IASC Operational Guidelines on the Protection of Persons in Situations of Natural Disasters*, January 2011, http://www.brookings.edu/reports/2011/0106_operational_guidelines_nd.aspx

This review of 2010 begins with an overview of the year's natural disasters and international response, followed by a more in-depth comparison of two of these devastating events: the January 2010 earthquake in Haiti and the floods in Pakistan. The discussion then turns to analysis of one particular group of people affected by disasters—renters—and to one particular kind of natural disaster—volcanic eruptions. Future annual disaster reviews will focus on the specific needs of other demographic groups affected by natural disasters as well as analyses of other natural hazards. This review concludes with references to further information from Brookings on natural disasters.

A WORD ON DEFINITIONS AND SOURCES

Natural hazards in themselves—hurricanes, floods, droughts—are not disasters. Rather it is their consequences and the ability of the local community to respond to them that determine whether the event is characterized as a disaster. If a cyclone washes over an uninhabited atoll in the Pacific, it is not a disaster. If the effects of flooding are easily dealt with by local authorities, it is not considered a disaster. This report relies on reporting by the International Disaster Database (EM-DAT)[3] in which an event is considered to be a disaster if at least one of the following criteria is fulfilled – 10 or more people reported killed, 100 people reported affected, declaration of a state of emergency, or an appeal for international assistance.[4]

The term "natural disasters" is ambiguous in that it is particularly difficult at times to distinguish between "natural" and "man-made" disasters. Recognizing the impact that human action has on whether a natural hazard results in a disaster, some refer simply to disasters, others to disasters triggered by natural hazards. Some would go so far as to argue that there are no "natural" disasters—that a "disaster" is the result of the failure of authorities to either prevent or respond adequately to the negative effects of natural phenomena.[5] The devastating toll on Haiti of four hurricanes in 2008 was obviously primarily the result of natural phenomena, but certainly their impact was exacerbated by long-term deforestation and poor governmental policies. In fact, in that year, severe hurricanes struck both Haiti and Cuba, but while 700 people died in Haiti, only seven fatalities were reported in Cuba.[6]

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[3] Since 1988 the WHO Collaborating Centre for Research on the Epidemiology of Disasters (CRED) has been maintaining an Emergency Events Database EM-DAT. EM-DAT was created with the initial support of the WHO and the Belgian Government. The main objective of the database is to serve the purposes of humanitarian action at national and international levels. It is an initiative aimed to rationalize decision making for disaster preparedness, as well as providing an objective base for vulnerability assessment and priority setting. EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

[4] EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

[5] Naomi Klein, The Shock Doctrine: The Rise of Disaster Capitalism, 2007

[6] EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be). In 2008, hurricanes Fay, Gustav, Hanna, and Ike killed 698 people in Haiti in August and September, while Hurricane Ike killed 7 in Cuba

Another definitional problem is the relationship between "sudden-onset" and "slow-onset" disasters. While floods, hurricanes, and earthquakes occur with little advance warning, it may take months or years for droughts or environmental degradation to seriously affect the development of an area or to overwhelm local capacity. While the difference between the two makes intuitive sense, there is no consensus on the dividing line between sudden- and slow-onset disasters. Nor are there even ac-

Defining affected people

EM-DAT defines affected people as: "People requiring immediate assistance during a period of emergency, i.e. requiring basic survival needs such as food, water, shelter, sanitation and immediate medical assistance. Appearance of a significant number of cases of an infectious disease introduced in a region or a population that is usually free from that disease." It further qualifies that "it can also include displaced or evacuated people."[7]

cepted definitions of the terms sudden and slow-onset disasters. For example, flooding, even though it is usually considered a sudden-onset disaster, sometimes occurs over a period of weeks or months as in Pakistan in mid-2010.

In practice, there is considerable ambiguity in how the term "affected people" is used. National disaster management agencies and NGOs use different definitions and standards for estimating the effects of disasters. As mentioned later in this report, for example, the large number of airline passengers stranded by the eruption of volcano Eyjafjallajökull are not considered as having been affected by the volcano. Nor are those whose livelihoods suffer as a result of the disaster considered to be people "affected" by the disaster, as for example tour operators in Moscow during the wildfires of 2010.

People who are displaced because of a natural disaster constitute one of the major challenges for both national authorities and international agencies. Collecting reliable statistics of the displaced is a complicated task as witnessed by the fact that estimates of the number of people displaced by Hurricane Katrina in 2005 ranged from 1 to 1.5 million[8] and there was no national tracking system to monitor the movements (or the returns) of IDPs displaced throughout the country.

[7] EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be: The EM-DAT Glossary, http://www.emdat.be/glossary/9 , and: Criteria and Definition, http://www.emdat.be/criteria-and-definition

[8] See: International Organization for Migration, "Migration, Climate Change and the Environment", May 2009, http://www.iom.int/jahia/webdav/shared/shared/mainsite/policy_and_research/policy_documents/policy_brief_envmig.pdf, p. 3. See also: Sandra Yin, Population Reference Bureau, "The Plight of Internally Displaced Persons", October 2005, http://www.prb.org/Articles/2005/ThePlightofInternallyDisplacedPersons.aspx

A 2009 study on disaster-induced displacement by UN OCHA, IDMC and the Norwegian Refugee Council found that in 2008 more than 36 million persons had been displaced by disasters out of a total of 207 million affected by disasters during that year.[9]

Data sources, methodology

The most widely cited and reputable source for data on natural disasters is the International Disaster Database (EM-DAT), which is a global database on natural and technological disasters that contains essential core data on the occurrence and effects of more than 18,000 disasters in the world from 1900 to present. EM-DAT is maintained by the Centre for Research on the Epidemiology of Disasters (CRED) at the School of Public Health of the Université catholique de Louvain located in Brussels, Belgium.

The database is compiled from various sources, including UN agencies, non-governmental organizations, insurance companies, research institutes and press agencies.[10]

[9] OCHA, IDMC, NRC, *Monitoring disaster displacement in the context of climate change*, September 2009, Available at: http://www.internal-displacement.org

[10] EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

CHAPTER 1:
2010: NATURAL DISASTERS IN NUMBERS

SECTION 1: DISASTER STATISTICS AND TRENDS IN 2010

After a relatively quiet 2009 (at least in terms of natural disasters[11]), the year 2010 began with the January 12th mega-disaster of the earthquake in Haiti. The quake killed over 316,000[12] Haitians, affected 3.7 million individuals, displaced more than 1.8 million people and caused some $8 billion in damages. From the moment it occurred, the Haitian earthquake and the ensuing relief and recovery efforts was the most prominent disaster reported in the international media throughout 2010. The other major disaster that captured the world's attention was the massive flooding in Pakistan which started in late July and in some areas lasted for months, inundating up to 20 percent of the country and affecting more than 20 million people. Both disasters posed unique challenges to the international humanitarian system. In Haiti the earthquake occurred in an urban setting in the poorest country of the Western Hemisphere. In Pakistan the "slow-motion tsunami"[13] took place in a volatile political environment and, according to the UN, affected more people than the 2004 Indian Ocean tsunami, the 2010 Haiti earthquake and the 2005 Pakistan earthquake combined.[14] Massive floods in China, which affected nearly 7 times as many people as the floods in Pakistan and top the list of natural disasters in 2010 in terms of affected population, received much less international attention than the Haitian and Pakistani disasters.

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11 The Centre for Research on the Epidemiology of Disasters reports 335 natural disasters worldwide in 2009 and 350 in 2008, compared with an average of 392 disasters per year for the period of 2000–2008. (See: Centre for Research on the Epidemiology of Disasters, *Annual Disaster Statistical Review 2009*: *The Numbers and Trends*, 2010, http://cred.be/sites/default/files/ADSR_2009.pdf; and Centre for Research on the Epidemiology of Disasters, *Annual Disaster Statistical Review 2008*: *The Numbers and Trends*, 2009, http://www.reliefweb.int/rw/lib.nsf/db900sid/ASAZ-7T3EUF/$file/CRED_Jun2009.pdf)

12 Associated Press, "Haiti Mourn Quake Dead, Find Hope in Own Resiliency", 12 Jan 2011, http://news.yahoo.com/s/ap/cb_haiti_earthquake

13 Guardian, "Pakistan Floods Are a 'Slow-Motion Tsunami'," 19 August 2010, http://www.guardian.co.uk/world/2010/aug/19/pakistan-flood-ban-ki-moon

14 Telegraph, " Pakistan Floods: Disaster Is the Worst in the UN's History", 9 August 2010, http://www.telegraph.co.uk/news/worldnews/asia/pakistan/7935485/Pakistan-floods-disaster-is-the-worst-in-the-UNs-history.html

TABLE 1 Top 10 Natural Disasters in 2010 by Number of Affected Persons*[15]

Country	Disaster type	No. of affected (million)
China PR (Fujian, Sichuan, Guangxi …)	Flood	134
China PR (Yunnan, Guizhou, Sichuan …)	Drought	60
Pakistan	Flood	18.1
Niger	Drought	7.9
Thailand	Drought	6.5
Ethiopia	Drought	6.2
China PR (Jilin Province)	Flood	6.0
Sudan	Drought	4.3
Kenya	Drought	3.8
Haiti	Earthquake	3.7
Total (including multiyear droughts)		294

*including persons affected by droughts that started before 2010

TABLE 2 Top 10 Natural Disasters in 2010 by Number of Deaths[16]

Country	Disaster	Killed
Haiti	Earthquake	316,000[17]
Russia	Heat wave	55,736
China PR	Earthquake	2,968
Pakistan	Flood	1,985
China PR	Landslides	1,765
China PR	Flood	1,691
Chile	Earthquake	562
Indonesia	Tsunami	530
Peru	Cold wave	409
Uganda	Landslides	388
Total 2010		390,300

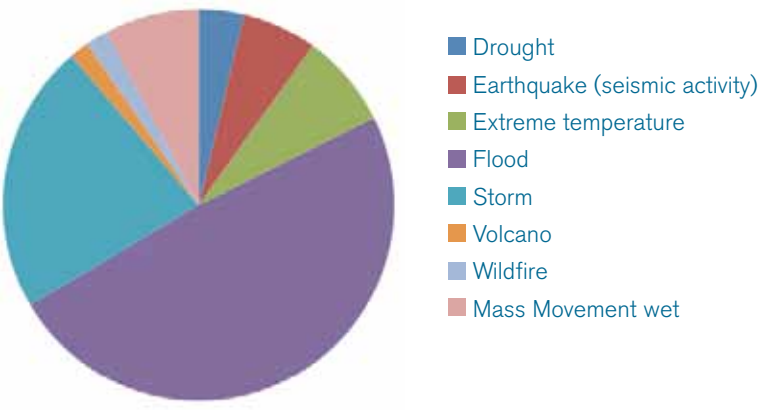
15 EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be
16 Ibid
17 Number of deaths for Haiti earthquake has been adjusted to latest casualty figures presented by the Government of Haiti

TYPES OF DISASTERS AND MOST AFFECTED COUNTRIES

In 2010, EM-DAT registered a total of 182 floods, 83 storms, 29 extreme temperature events, 25 landslides[18], 23 earthquakes (including tsunamis), 14 droughts, 7 wild fires, 6 volcanic eruptions, and 4 avalanches (see Chart 1)[19].

In 2010, the countries with the highest number of recorded natural disasters were China (22), India (16), Philippines (14), the United States (12), and Indonesia (11)[20].

CHART 1 Frequency of Natural Disasters/Category in 2010



Data source: EM-DAT: The OFDA/CRED International Disaster Database

COMPARING 2010 WITH THE PAST DECADE

EM-DAT recorded a total of 373[21] natural disasters in 2010, which is a significant increase from the 335 recorded in 2009. And yet the number of disasters recorded in 2010 was still below the average of 392 disasters per year that were reported in the 2000–2009 decade. Beyond simply counting the number of disasters in a given year, there are various ways to measure the impact of disasters: the number of deaths and injured, the number of people affected, and economic losses.

Due to the earthquake in Haiti, mortality figures were almost 5 times higher than the 10 year average, and almost 40 times higher than the number of deaths registered in 2009. 208 million people

[18] EM-DAT distinguishes between two kinds of hydrological disasters, "Flood" and "Mass Movement (wet)". Mass Movement (wet) includes avalanches, landslides, rockfalls and subsidence, See at: http://www.emdat.be/classification

[19] EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be. See also: Centre for Research on the Epidemiology of Disasters

[20] Reuters, "Cost of natural disasters $ 109 billion in 2010-U.N.", 24 January 2011

[21] *This number excludes 10 droughts that started before 2010 and affected 86 million persons*

were affected by disasters in 2010—a figure close to the 10 year average of 227 million affected people, but representing an increase of nearly 80 percent compared to the relatively quiet 2009.

TABLE 3 Natural Disasters 2000–2010[22]

	2000–2009 avg.	2008	2009	2010
Number of recorded Disasters	392	350	335	373
Number of deaths	78,087	235,000	10,655	296,800 (390,300[23])
Persons affected ($ millions)	227	214	119	208[24]
Damage ($ billions)	89.3	190.5	48.5	108.5

THE FORGOTTEN–OR NEGLECTED–DROUGHTS?

In terms of the number of people affected, six of the 10 disasters affecting the most people in 2010 were droughts. Slow-onset disasters such as droughts receive much less public attention than sudden-onset disasters such as earthquakes and floods. The devastation caused by a cyclone or an earthquake or a volcano occurs quickly—sometimes instantly—in a way that arouses public sympathy and media attention. Perhaps there is a universal identification with those affected by sudden events that simply does not exist for those affected by drought. Sudden-onset disasters also often conjure dramatic visual images—of children trapped in the rubble of a house destroyed by an earthquake or people clinging to roofs of buildings as floodwaters rise. In contrast, drought develops over time and images of farmers in dry or abandoned fields may convey less urgency than those affected by a volcanic eruption or an earthquake.

Droughts also present particular difficulties in data collection, beginning with the fact that there is no universal definition of what constitutes a drought. The World Meteorological Organization defines drought as "a sustained, extended deficiency in precipitation," while the UN Convention to Combat Drought and Desertification states that a drought is "the naturally occurring phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that adversely affect land resource production systems." In contrast, the UN's Food and Agricultural Organization defines a drought hazard as "the percentage of years when crops fail from lack of moisture."[25] In comparison, EM-DAT defines droughts as a "long lasting event, triggered by lack of precipitation. A drought is an extended period of time characterized by

[22] EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be. See also: Centre for Research on the Epidemiology of Disasters, *Annual Disaster Statistical Review 2009*, *The Numbers and Trends*, 2010, http://cred.be/sites/default/files/ADSR_2009.pdf

[23] Higher number adjusted to latest casualty figures presented by the Government of Haiti

[24] For reasons of comparability this numbers follow EM-DATs methodology and exclude multi-year droughts.

[25] Ashok K. Mishra, Vijay P. Singh, "A Review of Drought Concepts," *Journal of Hydrology* 391, (2010: 202–216), p. 206

a deficiency in a region's water supply that is the result of constantly below average precipitation. A drought can lead to losses to agriculture, affect inland navigation and hydropower plants, and cause a lack of drinking water and famine."

Under EM-DAT's methodology, the start date of droughts in the database is the day of the onset of drought related losses rather than the moment when the hazard occurred (e.g. the first day in a three month-long drought period which has no rain). If the date these losses occur is not available, then the date when the emergency is declared is taken as the starting date of the drought. If this is also not available, then the date of "report publication"[26] is used when entering data into the EM-DAT database. As with other disasters in EM-DAT, the end date for a drought in the database is the year and month at which the hazard ceases to exist.[27]

As it is difficult to determine excess mortality and damage figures from droughts unless they cause famines, the EM-DATs database seldom provides those figures for droughts. This means that in most cases mortality figures are only available for sudden-onset disasters (see Table 3). Furthermore, EM-DAT only creates an entry for droughts in the starting year of the drought and damage and casualty numbers, if available, are included for the entire period in that single entry. EM-DAT reports that 11 million people were affected by drought in 2010,[28] excluding those affected by droughts beginning earlier as in China (October 2009–May 2010), Niger (September 2009–March 2010), and Ethiopia (January 2009–August 2010). If we include the number of affected persons from the 10 droughts in EM-DATs database that started before 2010 (for example: Chinese drought, October 2009–May 2010; Niger drought, September 2009–March 2010, Ethiopia drought, January 2009–August 2010) and are therefore not mentioned in the 2010 statistics, the number of drought-affected persons in 2010 hypothetically climbs to 97 million and the number of disaster affected persons in 2010 climbs from 208 million to almost 300 million.[29]

In a longitudinal analysis of the impact of natural disasters, Below et al. found that over half of the 22 million deaths associated with natural hazards from 1900–2004 were due to drought, but that droughts accounted for only 7 percent of the estimated $1.2 trillion in economic losses caused by disasters in that same time period. The researchers noted that it is difficult to capture the indirect losses resulting from drought.[30]

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[26] EM-DAT does not comment on the specific meaning of this term

[27] EM-DAT, *New Methodology for Tracking Drought Disaster Events, Drought data in EM-DAT*, http://www.em-dat.net/documents/MethodologyWebPage.pdf

[28] EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

[29] Ibid

[30] Regina Below, Emily Grover-Kopec, Maxx Dilley, "Documenting Drought-Related Disasters: A Global Reassessment," *The Journal of Environment and Development*, vol. 16, no. 3, September 2007, pp. 339–340

DISASTER DAMAGE

Disaster damage figures need to be considered with extreme caution. As EM-DAT only provides such estimates for fewer than 70 out of the 373 natural disasters, it can be assumed that the real cost of natural disasters in 2010 was much higher than the $108.5 billion reported. Overall the estimate of worldwide disaster-related economic losses is about 20 percent above the 10 year statistical average and more than double the 2009 figures (see Table 3). In an even higher estimate, Swiss Re, one of the world's largest reinsurers, reported preliminary damage estimates from man-made and natural disasters to be $222 billion in 2010, more than three times the 2009 figure.[31]

The three disasters with the highest economic impact, according to EM-DAT were the February earthquake in Chile ($30 billion), the floods and landslides in China ($18 billion), and the floods in Pakistan ($9.5 billion). This is in line with the finding that poor countries tend to have more human casualties and wealthier countries experience greater economic losses from natural hazards. As indicated in the table below, there are striking differences in the impact of natural disasters in developed and developing countries. For example, from 1991–2005, ten times as many people died

TABLE 4 Number of People Reported Killed and Affected in Disasters and Reported Economic Damages by Level of Development, 1991–2005[32]

Region[33]	Number of people reported killed	Number of people reported affected	Economic damages (2005 $ billions)
OECD	61,918	37,723,852	714.61
CEE + CIS	10,412	25,848,223	50.35
Developing countries	630,106	3,035,655,591	379.15
Least developed countries	254,739	368,673,811	22.61
Countries not classified	3,327	2,261,484	26.22
TOTAL	960,502	3,470,162,961	1192.95

in disasters in developing countries as in OECD member countries and over a third of those in developing countries who died were from the 50 least developed countries. This is a much greater percentage than those affected by disasters, suggesting that death rates are relatively higher in the

[31] Swiss Re, "Preliminary Estimates for 2010 from Swiss Re Sigma Show that Natural Catastrophes and Man-made Disasters Caused Economic Losses of USD 222 Billion and Cost Insurers USD 36 Billion",30 November 2010, http://www.swissre.com/media/media_information/Preliminary_2010_catastrophes_estimates_from_sigma.html

[32] International Strategy for Disaster Reduction, http://www.unisdr.org/disaster-statistics/pdf/isdr-disaster-statistics-impact.pdf

[33] OECD includes 30 countries or areas, CEE 27 countries or areas, developing countries 137, least developed countries 50 – also included in the developing countries statistics

least developed countries. This is likely due to less robust construction of housing and other buildings and less developed warning systems. But analysis of economic damages reveals a very different pattern with losses in OECD countries almost twice as much as in developing ones. This is most likely due to the fact that the cost of rebuilding an edifice destroyed in a disaster is much higher in developed than developing countries, but may also reflect the fact that reporting on economic damages is more complete in developed than developing countries. Or put another way, while 26 percent of reported deaths in all disasters over a 14 year period occurred in the least developed countries, less than 2 percent of the economic damages were reported by those countries.

THE EFFECTS OF CLIMATE AND WEATHER

The statistics reveal that 344 out of the 373 recorded disasters (92.2 percent) in 2010 were climatological or hydro-meteorological disasters. The 182 floods reported in 2010 affected almost 180 million people and killed more than 8,100. This is almost double the average number of people affected every year by floods during the 2000–2009 period and almost 60 percent above annual average mortality rates.[34]

TABLE 5 Comparison: Floods, Mass Movements (wet), Storms 2000–2009 and 2010[35]

	Floods	Mass Movements (wet)*	Storms
2010 recorded	182	29	83
2000–2009 average recorded	173	19	105
2010 killed	8,119	3,258	1,367
2000–2009 average killed	5,401	763	17,222
2010 affected (million persons)	178.9	2.5	8.0
2000–2009 average affected (million persons)	94.8	0.15	39.7

*For 2010 including 25 landslides and 4 avalanches; for 2000–2009 data including landslides, avalanches, rockfalls and subsidence[36]

[34] EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

[35] EM-DAT, "2010, Disasters in Numbers", Press conference, http://cred.be/sites/default/files/PressConference2010.pdf

[36] EM-DAT defines subsidence as: "Downward Motion of the Earth's Surface Relative to a Datum (e.g. the sea level). Subsidence is the motion of the Earth's surface as it shifts downward relative to a datum (e.g. the sea level). Subsidence (dry) can be the result of: geological faulting, isostatic rebound, human impact (e.g. mining, extraction of natural gas) etc. Subsidence (wet) can be the result of: karst, changes in soil water saturation, permafrost degradation (thermokarst) etc"; EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

2010 was also a particularly deadly year for those affected by landslides and avalanches, which together killed 3,258 persons compared to an average of 763 persons killed per year in the preceding decade. Whereas floods and landslides caused heavy damage, in 2010 storms were relatively benign. The year saw 83 recorded storms, significantly less than the previous decade's average of 105. Storms in 2010 killed 1,367 people in comparison with the average 17,222 deaths per year in the preceding decade and affected 8 million people—about one-fifth the average 39.7 million affected per year in the preceding decade (see Table 5).

While the Atlantic hurricane season brought 19 named storms—the second highest number of storms since 1950—none of these caused anywhere near the amount of destruction as either the hurricanes in 2008 or Hurricane Katrina in 2005.[37] Most likely owing to the change from El Niño to La Niña, the west Pacific had relatively few storms in 2010. The highest numbers of casualties from storms were due to Hurricane Agatha in Guatemala (174) and by Typhoon Conson in the Philippines (146).[38]

La Niña is characterized by unusually cool ocean surface temperatures in the central and eastern tropical Pacific—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. Once these climate patterns are established, they typically last for nine months or longer. La Niña developed quickly in June and July 2010, following the dissipation of the 2009/2010 El Niño.[39] The influence of La Niña was seen as a major cause of the floods and landslides in Pakistan, the Philippines, Australia, Colombia, Venezuela, Brazil, and South Africa. The shift from El Niño to La Niña climate patterns can also explain the fact that some countries (China,[40] Thailand) experienced major droughts in the first half of the year followed by flooding in mid-year. In accordance with observations from previous La Niña episodes, La Niña is believed to have caused above-average rainfall in Australia, Indonesia, South-East Asia and Southern Africa, and below-average rainfall in Eastern Equatorial Africa, Central-Southwest Asia and South-Eastern South America.[41]

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37 Greg Postel, "Hurricane Season in 2010 Made History", Washington Post, 18 November 2010, http://voices.washingtonpost.com/capitalweathergang/2010/11/hurricane_season_in_2010_made.html

38 EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

39 World Meteorological Organization, "WMO Update Says La Niña Expected to Continue through First Quarter of 2011 but Gradually Weaken", 25 January 2011, http://www.reliefweb.int/rw/rwb.nsf/db900sid/MUMA-8DFVUY/$File/full_report.pdf

40 Nature News, "China Drought Highlights Future Climate Threats", 11 May 2010, http://www.nature.com/news/2010/100511/full/465142a.html

41 World Meteorological Organization, "Press Release No. 907", 25 January 2011, http://www.wmo.int/pages/mediacentre/press_releases/pr_907_en.html

WHAT'S CLIMATE CHANGE GOT TO DO WITH IT?

Apart from the La Niña explanation, many commentators, from politicians to scientists and NGOs used climate change as an explanation for the severity of the many hydrometeorological disasters in 2010.[42] For example, in the case of the Pakistani floods, there was a widespread feeling in Pakistan that the floods were unusually severe because of climate change, but it is difficult to draw a clear causal connection.[43]

Global climate models predict a rise in the frequency and severity of hydrometeorological and climatological disasters and climate researchers have noted that extreme weather events occurring in 2010, such as the floods in Pakistan or the drought and wildfires in Russia, are in line with those predictions.[45] However, researchers are quick to point out that no single disaster can be directly attributed to climate change.[46] But with 2010 tying 2005 for the warmest year in more than a century[46] and with record-breaking temperatures in 37 countries, including Pakistan, suspicions that climate change plays a role in causing natural disasters seem well heralded.[47]

Some explanations attribute the occurrence of both the drought in Russia and the floods in Pakistan to a shift in the jet streams, which are a massive ring of high-speed winds. "This year, the high level jet stream has been in an unusual wave pattern since mid-July—with a series of ridges and troughs stretching from western Europe to eastern China. This brought high pressure and dry, very hot conditions over western Russia and caused an intensification of the monsoon rains over Pakistan."[48] Similarly, the unusual cold and snowy winter in the United States and parts of Europe, coupled with extremely warm temperatures in the Arctic, was explained by some scientists as a "bulge" in the jet streams.[49] Again, scientists insist that further research is needed before they can prove that the unusual jet stream patterns are linked to global warming.

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[42] See: AOL news, "UN Links Pakistan Floods to Climate Change", 20 August 2010 and ClimateWire, "Pakistan's Climate Change Floods, Seen From Above", 24 August 2010

[43] Alice Thomas, Renata Rendon, *Confronting Climate Displacement, Learning from Pakistan's Floods*, Refugees International, November 2010, http://www.refintl.org/policy/in-depth-report/confronting-climate-displacement

[44] See: Intergovernmental Panel on Climate Change, www.ipcc.ch

[45] Reuters, "Analysis: Pakistan floods, Russia heat fit climate trend", 9 August 2010, http://www.reuters.com/article/2010/08/09/us-climate-extreme-idUSTRE6782DU20100809

[46] In fact, in 2010 recorded temperatures on earth were 0.62°C (1.12°F) warmer than the twentieth century average. New York Times, "Figures on Global Climate Show 2010 Tied 2005 as the Hottest Year on Record", 12 January 2010, http://www.nytimes.com/2011/01/13/science/earth/13climate.html

[47] National Climatic Data Center, National Oceanic and Atmospheric Administration, State of the Climate Global Analysis, Annual, 2010, January 2011, http://www.ncdc.noaa.gov/sotc/global/

[48] Walker Institute, "Pakistan Floods (Late July/August 2010)", http://www.walker-institute.ac.uk/news/news_pakistanfloods.htm

[49] New York Times, "A 'Bulge' in Atmospheric Pressure Gives Us a Super-Cold Winter Amid Global Warming", ClimateWire, 5 January 2011, http://www.nytimes.com/cwire/2011/01/05/05climatewire-a-bulge-in-atmospheric-pressure-gives-us-a-s-70646.html

A LOOK AT SOME OF THE OTHER DISASTERS IN 2010

While international attention perhaps inevitably focused on the two mega-disasters of 2010, other disasters also had enormous impact in the year under review.

Chile earthquake

A three-minute 8.8-magnitude earthquake struck central Chile in February 2010, killing over 700 people and displacing 2 million. This was one of the strongest earthquakes in recorded history, with its epicenter off the coast of the Maule region 120 miles from the capital city Santiago and 70 miles from Concepción, the country's second largest and most affected city located in the Bío-Bío region.[50] The earthquake reportedly released more than 400 times the energy of the 2010 Haiti earthquake making it the most powerful since the 2004 earthquake that triggered the Indian Ocean tsunami and the fifth largest since 1900. The quake also triggered a tsunami which travelled throughout the Pacific basin and was detected by the Pacific basin's tsunami warning network but caused little damage beyond the Bío-Bío region, where 65 percent of the earthquake and tsunami damage occurred. The Chilean army assisted in providing security and relief in the initial aftermath.[51] According to a government report, over $10 billion was needed for reconstruction: $4 billion for 160,000 houses damaged beyond repair; $3 billion for education (damaged schools); $2.8 billion for health (damaged hospitals); $1 billion in the transport industry; $39 million for economic loss in agriculture; and $39 million for economic loss in the fisheries sector.[52]

A total of $69 million was provided in 2010 from various donor countries and the Red Cross/Red Crescent, with the most funds ($18 million) coming from private funding from individuals and organizations, and $10 million from the UN's Central Emergency Response Fund (CERF).[53]

Chile has upgraded its construction standards since a major earthquake in 1929 and its anti-seismic codes are said to be among the best in the world. However, the 2010 earthquake revealed the need for vigilance in implementing mitigation measures as some reports attribute the damage to the practice of shifting from municipal oversight of construction to self-regulation by construction companies.[54]

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[50] New York Times, "Maps of the Chile Earthquake", 3 March 2010, www.nytimes.com/interactive/2010/02/27/world/americas/0227-chile-quake-map.html

[51] New York Times, "Frantic Rescue Efforts in Chile as Troops Seek to Keep Order", 27 February 2010, www.nytimes.com/2010/03/01/world/americas/01chile.html?_r=1

[52] OCHA, Chile Earthquake Situation Report # 9, 29 March 2010, www.reliefweb.int/rw/RWFiles2010.nsf/FilesByRWDocUnidFilename/MUMA-83ZVMD-full_report.pdf/$File/full_report.pdf; See also: Christian Science Monitor, "Chile Quake 2010: Tsunami Warning System Worked as Intended", 1 March 2010, www.csmonitor.com/Science/2010/0301/Chile-quake-2010-Tsunami-warning-system-worked-as-intended

[53] OCHA, Financial Tracking Service, "CHILE – Earthquake – February 2010, Table B: Total Humanitarian Assistance per Donor (Appeal plus other*)", 24 February 2011, http://fts.unocha.org/reports/daily/ocha_R24_E15832___1102231501.pdf

[54] Global Post, "Why Were Chile's Newest Buildings Prone to Destruction?", 17 March 2010, www.globalpost.com/dispatch/chile/100315/building-codes-earthquake?page=full

Niger drought

A prolonged drought blanketing the Eastern Sahel in West Africa from Mauritania to Chad affected over 10 million people as of June 2010, including 7–8 million in Niger (around half its population) and 2 million in Chad.[55] Rainfall was an estimated 70 percent below normal in the region in 2009, and crop failure included cereal production which fell 11,000 tons short in 2009. Crop and livestock along with the related surge of food prices caused increasing hunger, most critically in Niger, which is the world's third least developed country according to UNDP and heavily dependent upon agriculture. The global acute malnutrition rate for children in Niger stood at 16.7 percent for children aged under five, exceeding the 15 percent emergency threshold and the 12.3 percent rate of 2009—and increased from 17 percent to 22.1 percent in the Diffa region and from 13.1 percent to 19.7 percent in the Maradi region.[56] By April 2010, the Government of Niger had declared an emergency and requested international assistance and the UN launched an Emergency Humanitarian Action Plan (EHAP)—which is part of the UN's West Africa Consolidated Appeal Process (CAP) 2010[57]—for $191 million to assist 7.1 million food-insecure people. Notably, 75 percent of the original EHAP was met by July 2010, when it was revised to $371 million, leaving a funding shortfall of $229 million.[58] As of February 2011, half of the $774 million requested for the West Africa CAP 2010, which incorporated the Niger EHAP, had been provided.[59]

Despite warnings of the impending crisis, and the improved political context, donor countries did not mobilize resources quickly. One of these warnings was issued by Fewsnet, the famine early warning network run by the U.S. Agency for International Development (USAID) and the Nigerian government, which had warned about the poor millet harvest in the eastern Sahel region well in advance, in October 2009. Yet by August 2010, only one-third of the funding required for the UN's West Africa Consolidated Appeal Process had been made available. In Niger, this prompted the World Food Programme, in charge of feeding the bulk of the hungry, to feed only children younger than 2 and their families.[60] Nevertheless, the humanitarian response is said to be better than during

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[55] UN News Center, "Over 7 million people in Niger Facing Food Insecurity Owing to Bad Harvest, Warns UN", 23 February 2010, www.un.org/apps/news/story.asp?NewsID=33860&Cr=&Cr1; See also: Guardian, "Niger's Markets Are Full Yet Famine Shadows the Dusty Roads", 1 August 2010, www.guardian.co.uk/world/2010/aug/01/niger-famine-food-crisis

[56] UN Consolidated Appeals Process, *Mid Year Review*, www.reliefweb.int/rw/RWFiles2010.nsf/FilesByRWDocUnidFilename/VVOS-874S7L-full_report.pdf/$File/full_report.pdf, pp. 49–50

[57] OCHA, "Humanitarian Appeal: Consolidated Appeal for West Africa 2010", 14 July 2010, http://ochaonline.un.org/humanitarianappeal/webpage.asp?Page=1880

[58] OCHA, "Niger Emergency Humanitarian Action Plan Revision (16 July 2010)", 16 July 2010, www.reliefweb.int/rw/rwb.nsf/db900SID/LSGZ-87JGA7?OpenDocument; For an overall aid snapshot of the crisis in 2010, see: Global Humanitarian Assistance, "Funding According to Needs: the Niger Food Crisis 2010", 28 September 2010, www.globalhumanitarianassistance.org/funding-according-to-needs-the-niger-food-crisis-2010-1527.html

[59] OCHA, Financial Tracking System, "Emergency West Africa 2010", http://fts.unocha.org/pageloader.aspx?page=emerg-emergencyDetails&appealID=874

[60] Guardian, "Food Crisis in the Sahel: Unlearned Lessons", 3 August 2010, www.guardian.co.uk/commentisfree/2010/aug/03/eastern-sahel-food-crisis-aid?INTCMP=ILCNETTXT3487v

the 2005 famine due to droughts and locusts which affected far fewer people (though still a staggering 2.5 million people) when the issue of chronic hunger was politically charged and donor response was slow.

Russia heat wave and wildfires

The rampant wildfires that spread throughout European Russia in late July and early August 2010 resulted from a dangerous combination of climbing temperatures which reached record highs of up to 100 degrees Fahrenheit (38 degrees Celsius) and droughts resulting from El Niño climate patterns.[61] Years of poor central planning also contributed to the severity of the fires, as flames swept through peat bogs which had been initially drained by Soviet engineers to provide a source of peat for electrical power without being subsequently reflooded.[62] The direct death toll as a result of the wildfires came to 53 people, on top of the death toll of the heat wave which as EM-DAT reports was the second most deadly disaster in 2010 with 55,736 people killed.[63] Smog and heat saw Moscow's mortality rates double from the previous year.[634] The Russian Federation's Health Ministry reported that carbon monoxide levels climbed to 6.5 times their maximum permissible level, with other unspecified toxins reaching "up to 9 times' acceptable limits."[65] Wildfire flames engulfed and destroyed more than 2,000 homes, propelling Russian authorities to dispatch 2,000 defense ministry troops and 3,000 interior ministry personnel to assist the 10,000 firefighters in suppressing these blazes.[66] City officials opened 123 "anti-smog" centers in the form of air-conditioned rooms in hospitals and government buildings to offer Moscow residents some relief from the smog and oppressive heat as few households in the metropolis have air-conditioning units in their homes. About 90 flights from Moscow airports were delayed or diverted as a result of low visibility from the smoke which precluded even emergency employees from navigating the skies via planes or helicopters.[67]

Of the most devastating aspects of the country's heat wave and subsequent wildfires was the destruction of one-fifth of Russia's wheat crop, which pushed Prime Minister Vladimir Putin to ban wheat exports from 15 August to 31 December as the country reached into emergency reserves of

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61 BBC News, "Death Rate Doubles in Moscow as Heatwave Continues", 9 August 2010, http://www.bbc.co.uk/news/world-europe-10912658; Jakarta Post, "Moscow Deaths Double Amid Smog to 700 People a Day", 09 August 2010, http://www.thejakartapost.com/news/2010/08/09/moscow-deaths-double-amid-smog-700-people-a-day.html

62 New York Times, "Past Errors to Blame for Russia's Peat Fires", 12 August 2010, http://www.nytimes.com/2010/08/13/world/europe/13russia.html?_r=2&ref=world

63 EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

64 BBC News, "Death Rate Doubles in Moscow as Heatwave Continues", 9 August 2010, http://www.bbc.co.uk/news/world-europe-10912658

65 Christian Science Monitor, "Russia Wildfires: Thick, Toxic Smog Chokes Moscow Residents", 8 Aug 2010, http://www.csmonitor.com/World/Europe/2010/0808/Russia-wildfires-Thick-toxic-smog-chokes-Moscow-residents

66 Al Jazeera English, "Russia Struggles with Wildfires", 3 August 2010, http://english.aljazeera.net/news/europe/2010/08/201083114931428770.html

67 Washington Post, "Record Heat Wave and Fires Prompt Moscow to Open Relief Centers", 9 August 2010, http://www.washingtonpost.com/wp-dyn/content/article/2010/08/08/AR2010080802817.html

the crop, and later extended the ban to continue through late 2011.[68] This export ban has seen global reverberations as food prices around the world have escalated, and was an impetus for the United Nations Food and Agricultural Organization's convening of an emergency meeting on rising food grain prices.[69] Environmental organizations also warned of the potential spread of radioactive particles embedded in the soil from the Chernobyl nuclear disaster of 1986 as a result of winds blown from Bryansk, the area which had suffered the greater part of nuclear fallout from this incident.[70]

New Zealand earthquake

A 7.0-magnitude earthquake struck South Island, New Zealand in September 2010, causing widespread damage but no fatalities and only two serious injuries. The quake damaged nearly two-thirds of the 160,000 homes in and around Christchurch, the second largest city in New Zealand with a population of 350,000. The damage, totaling $1.4 billion, also included power outages, damaged farms, roads, sewer lines and water pipes and closed the central business district. In September, Prime Minister John Key said before damage estimates were available that the government would aim to cover at least 90 percent of the rebuilding needs, and he allocated USD $3.6 million to reconstruction that month. Most of the affected were expected to claim from their insurers and the Earthquake Commission (EQC).[71]

The most devastating of the hundreds of recorded aftershocks since September was the 6.3-magnitude earthquake which struck Christchurch on February 22, 2011. Although it was weaker than the previous quake, it caused many fatalities and more damage because it struck closer to the city's center, was four times closer to ground level, buildings had been weakened by the September quake and subsequent aftershocks, and it struck at lunch time during the work week, rather than in the middle of the night as was the case with the September 2010 earthquake. One day after the earthquake, there were 75 confirmed fatalities and 300 people were missing, and damages amounted to an estimated $12 billion.[72]

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[68] Washington Post, "Russia Bans Grain Exports Because of Fire and Drought, Sending Prices Soaring", 6 August 2010, http://www.washingtonpost.com/wp-dyn/content/article/2010/08/05/AR2010080502470.html; Wall Street Journal, "Putin Extends Wheat-Export Ban", 22 February 2011, http://online.wsj.com/article/SB10001424052748703431604575467653502455776.html

[69] International Business Times, "UN Calls for Emergency Meeting on Rising Food Prices", 3 September 2010, http://www.ibtimes.com/articles/49115/20100903/wheat-russia-un-fao-export-food-grain-prices-cereal-outlook.htm

[70] BBC News, "Russia Combats Wildfires in Chernobyl Radiation Zone", 11 August 2010, http://www.bbc.co.uk/news/world-europe-10938215

[71] Businessweek, "New Zealand's Key Pledges Subsidies on Visit to Earthquake Zone", 7 September 2010, www.businessweek.com/news/2010-09-07/new-zealand-s-key-pledges-subsidies-on-visit-to-earthquake-zone.html; BBC News, "New Zealand Earthquake 'Damaged 100,000 Homes", 6 September 2010, www.bbc.co.uk/news/world-asia-pacific-11191105

[72] The Washington Post, "Obama Expresses Condolences to New Zealand Leader", 23 February 2011, www.washingtonpost.com/wp-dyn/content/article/2011/02/23/AR2011022303766.html; Guardian, "Christchurch Earthquake: At Least 65 dead and 100 Trapped in 'Darkest Day'", 22 February 2011, www.guardian.co.uk/world/2011/feb/22/christchurch-earthquake-65-dead-100-trapped

Typhoon Megi

The strongest storm to hit the Philippines since 2006, super typhoon Megi affected nearly 2 million people in six Regions of Luzon, resulting in 31 deaths, 42 injuries, and 4 missing people. The Category 5 typhoon struck the Isabella Province in the Northern Philippines on 18 October 2010, rendering 200,000 people homeless.[73] Damages resulting from the storm were not limited to the Philippines. The typhoon's path also trailed across Taiwan where landslides and flooding killed 36 people, in addition to 20 Chinese tourists whose coach had gone missing in the midst of the typhoon's intense rains on 21 October.[74] Megi also caused intense flooding in Vietnam, resulting in 75 deaths and later struck China as a tropical storm, where 282,300 people were evacuated.[75] Many residents in the storm-affected region had still been recovering from the damages to their homes and livelihoods from other recent floods such as those caused by Typhoon Conson in July 2010.[76]The medium- to long-term economic impact of the typhoon is likely to be significant, with losses of over 520,000 tons to rice crop, which have occurred largely in the Isabella province, the Philippines' second main producer of rice in the country.[77] Such damages to harvests in the Philippines, a major global importer of rice, may result in increased prices globally in 2011.[78] UN OCHA reported in late October 2010 that short-term needs in disaster relief primarily involve emergency shelter provisions as well as food and water assistance. In addition, a total of 23,788 individuals were reported to have been displaced as of 25 October, with 6,719 of these remaining in Evacuation Centers.[79] The International Federation of Red Cross and Red Crescent Societies (IFRC) reported that relief efforts have been largely underfunded, with the IFRC's appeal for 4.2 million francs, for example, only

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[73] BBC News, "Super Typhoon Megi Hits Northern Philippines", 18 Oct 2010, http://www.bbc.co.uk/news/world-asia-pacific-11562238; United Nations, "Philippines Typhoon Megi Situation Report No. 4", 2010, http://www.reliefweb.int/rw/RWFiles2010.nsf/FilesByRWDocUnidFilename/EGUA-8AKP4M-full_report.pdf/$File/full_report.pdf; See also: BBC News, "Typhoon Megi Leaves 200,000 Homeless in Philippines", 20 Oct 2010, http://www.bbc.co.uk/news/world-asia-pacific-11581196.

[74] Bloomberg, "Typhoon Megi Claimed 36 Lives in Taiwan as Chinese Tourists Declared Dead", 3 Nov 2010, http://www.bloomberg.com/news/2010-11-03/taiwan-death-toll-from-typhoon-megi-rises-as-china-tourists-declared-dead.html; See also: China Daily, "Typhoon Megi Leaves Path of Chaos", 25 Oct 2010, http://www.chinadaily.com.cn/china/2010-10/25/content_11450807.htm

[75] Christian Science Monitor, "9 Dead, 23 Missing After Typhoon Megi Hits Taiwan", 22 Oct 2010, http://www.csmonitor.com/World/Latest-News-Wires/2010/1022/9-dead-23-missing-after-Typhoon-Megi-hits-Taiwan; See also: Xinhua News Agency, "Typhoon Megi Lands in Southeast China, 270,000 Evacuated", 24 Oct 2010, http://news.xinhuanet.com/english2010/china/2010-10/24/c_13572310.htm

[76] Guardian, "Super Typhoon Megi Hits Philippines", 18 Oct 2010, http://www.guardian.co.uk/world/2010/oct/18/super-typhoon-megi-hits-philippines

[77] United Nations, "Philippines Typhoon Megi Situation Report No. 4", 2010, http://www.reliefweb.int/rw/RWFiles2010.nsf/FilesByRWDocUnidFilename/EGUA-8AKP4M-full_report.pdf/$File/full_report.pdf; See also: Edmonton Journal, "Storm Threatens Global Economy" 20 Feb 2011, http://www.edmontonjournal.com/news/Storms+threaten+global+economy/4316852/story.html

[78] BBC News, "Super Typhoon Megi Hits Northern Philippines", 18 Oct 2010, http://www.bbc.co.uk/news/world-asia-pacific-11562238

[79] United Nations, "Philippines Typhoon Megi Situation Report No. 4", 2010, http://www.reliefweb.int/rw/RWFiles2010.nsf/FilesByRWDocUnidFilename/EGUA-8AKP4M-full_report.pdf/$File/full_report.pdf, 1–2

receiving 20 percent of requested funds.[80] The recent typhoons and accompanying flooding have sparked concentrated efforts by the Philippines government to improve disaster preparation and response, as seen by President Benigno Aquino's firing of the central weather bureau's head after failing to warn of Typhoon Conson's arrival in July 2010.[81] Government and aid officials also stressed the role of social networking sites such as Facebook and Twitter, highlighting the role of such services in reducing the number of potential casualties which occurred as a result of Typhoon Megi.[82]

Colombia floods

In the worst flooding in at least three decades in Colombia, 2.3 million people—around 5 percent of the population—were affected throughout 2010 and into 2011 as La Niña extended the first of two annual rainy seasons, beginning in April, merging it with the second. An important canal levee in Colombia's Atlantic coast was breached; landslides and floods killed over 300 people, destroyed 6,700 homes and damaged 350,000 others and destroyed over 3.2 million acres of agricultural land.[83] The floods disproportionately affected Colombians already displaced by conflict—particularly indigenous and Afro-Colombians[84] who tend to live in remote areas subject to violence from armed groups and where there is little or no state presence—as well as IDPs in shanty towns. However, data on conflict IDPs subsequently displaced by the floods is not available as it does not appear to be tracked by the UN or the Colombian government.

The torrential rains prompted President Juan Manuel Santos to declare a 60-day state of emergency in 28 of the country's 32 departments in November 2010 and to enlist the support of the international community. As of December 2010, the Government of Colombia had mobilized $23.1 million through the National Calamity Fund and had collected $16.7 million through the public campaign "Colombia Humanitaria." As of the same date, the UN's Central Emergency Response Fund (CERF) had allocated $6.6 million to the floods crisis in Colombia.

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80 ReliefWeb, "Philippines: More Funding Needed as Typhoon Megi Survivors Face Fresh Deluge", 17 Nov 2010, http://www.reliefweb.int/rw/rwb.nsf/db900SID/JDUN-8BB2XS?OpenDocument

81 BBC News, "Super Typhoon Megi Hits Northern Philippines", 18 October 2010, http://www.bbc.co.uk/news/world-asia-pacific-11562238

82 IRIN, "In Brief: Social Media Network Helps Prevent Disaster", 19 Oct 2010, http://www.irinnews.org/Report.aspx?ReportID=90821

83 CNN News, "State of emergency in flooded Colombia", 19 November 2010, http://articles.cnn.com/2010-11-19/world/colombia.rain.calamity_1_heavy-rains-emergency-colombian-government?_s=PM:WORLD; see also: PLAN, "Las inundaciones en Colombia dejan a miles de niños y niñas sin hogar", 16 Feb 2011, www.reliefweb.int/rw/rwb.nsf/db900sid/MAPA-8E6NWQ?OpenDocument&rc=2&emid=LS-2010-000190-COL; see also: UN Central Emergency Response Fund (CERF) "CERF Around the World: Colombia 2010", 9 December 2010, http://ochaonline.un.org/CERFaroundtheWorld/Colombia2010/tabid/6609/language/en-US/Default.aspx

84 See for example, UN Human Rights Council, *Report of the independent expert on minority issues, Gay McDougall – Addendum: Mission to Colombia*, A/HRC/16/45/Add.1, 25 January 2011; UN Human Rights Council, *Report of the Representative of the Secretary-General on the human rights of internally displaced persons, Walter Kälin – Mission to Colombia*, A/HRC/4/38/Add.3, 24 January 2007, available at: http://ap.ohchr.org/documents/dpage_e.aspx?m=71

http://www.flickr.com/photos/unitednationsdevelopmentprogramme/4274632540/sizes/l/in/photostream/

Photo: © United Nations Development Programme

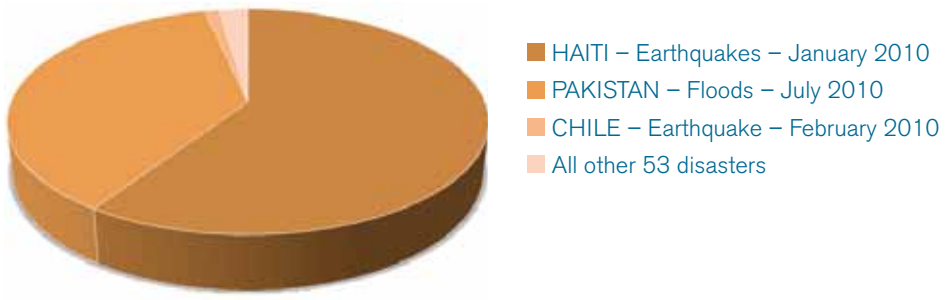
Young Haitian injured by the earthquake.

SECTION 2: HUMANITARIAN FUNDING IN 2010

DISPROPORTIONATE FUNDING IN DISASTER RESPONSE

As mentioned above, EM-DAT estimates natural disaster-related damages in 2010 at $108.5 billion, which is higher than the GDP of Bangladesh[85] and also significantly above the 10 year average of disaster-related damages from 2000–2009. With reported damages so far above average, one might expect a corresponding increase in international funding for disaster relief and recovery operations. Indeed, in early 2010, following the tragic earthquake in Haiti, there was a massive flow of pledges and donations, both from private donors and governments. Even though not all of the pledges actually arrived, according to the UN's Financial Tracking Service,[86] the relief efforts in Haiti received the highest level of international financial support with more than $3.5 billion in 2010, covering more than 40 percent of the estimated damage from the earthquake. Second highest in terms of funding was support for flood relief in Pakistan, which received more than $2.2 billion in 2010, covering more than 23 percent of the estimated damage due to the floods.[87] This figure is particularly interesting, given widespread reports in the international media about donor fatigue and the low level of funding for Pakistan. (For a more detailed comparison of the floods in Pakistan and the earthquake in Haiti, and a discussion of the role of the media, see Chapter 2 in this review.)

CHART 2 UN Financial Tracking Service, Natural Disaster Funding 2010*



*Source: UN OCHA, "Natural Disasters in 2010", Financial Tracking Service, 31 January 2011

[85] Central Intelligence Agency, "Bangladesh, Nominal GDP", The World Fact Book, January 2011, https://www.cia.gov/library/publications/the-world-factbook/geos/bg.html

[86] The Financial Tracking Service (FTS) is a global, real-time database which records all reported international humanitarian aid(including that for NGOs and the Red Cross / Red Crescent Movement, bilateral aid, in-kind aid, and private donations). 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

[87] OCHA, Financial Tracking Service,"Natural Disasters in 2010", 31 January 2011, http://fts.unocha.org/pageloader.aspx?page=emerg-emergencies&section=ND&Year=2010

As shown in Chart 2, these two emergencies received a total of 96.56 percent of all natural disaster humanitarian funding recorded by the UN's Financial Tracking System in 2010 with 54 other major disasters accounting for the remaining 3.54 percent of humanitarian funds. The other 317 reported disasters evidently received no international funding or are not included in the UN's Financial Tracking System.

It is not a new insight that international funding for disaster relief is extremely disproportionate from disaster to disaster. For example, total funding for those affected by the 2004 tsunami "was over $7,100 for every affected person, which contrasts starkly, for example, with funding of only $3 per head actually spent on someone affected by floods in Bangladesh in 2004."[88] The year 2010 is a quintessential example of a long-standing trend.

Analysis of international funding patterns and trends necessarily relies on statistics reported by the UN's Financial Tracking System, but this captures only funds reported to the UN by governments, the Red Cross/Red Crescent Movement, and large international NGOs. Smaller NGOs and civil society organizations often channel significant amounts of funding directly to communities affected by disasters which consequentially are not reported in the UN's summary. The UN's Financial Tracking System does not capture the many significant financial contributions made by local NGOs and civil society organizations. Moreover, remittances—which dwarf overseas development assistance generally—are an important source of support for communities affected by disasters. The Center for Global Prosperity, for example, reports that remittance flows generally increase during and after natural disasters and other crises, indicating that they are an important financial backstop.[89] These contributions are never counted in the statistics and tables compiled by the UN and other financial tracking systems. Thus while much attention is devoted to international funding of disasters, it must be recognized that international contributions are only a part of the total response.

While according to UN data, funding for Haiti relief and recovery in 2010 reached $3.5 billion—which represents 43.86 percent of the estimated damage—and the funding for the Pakistani flood relief and recovery raised $2.2 billion, representing 23.17 percent of the estimated damage, the $68 million in funding for the Chilean earthquake only amounted to 0.23 percent of the damage and the $0.15 million for the Chinese floods (which affected over 100 million people) amounted to less than 0.001 percent of the estimated disaster damage. If the data are analyzed in dollars per affected person, the differences are even more dramatic. For every disaster-affected person in Haiti in 2010 there was international funding of $948.37, the corresponding figure for a person affected by the

[88] John Telford and John Cosgrave, *Joint Evaluation of the International Response to the Indian Ocean Tsunami: Synthesis Report* (London: Tsunami Evaluation Coalition, July 2006), p. 21. See also John Cosgrove, "Humanitarian Funding and Needs Assessment," in *The Human Response Index 2008: Donor Accountability in Humanitarian Action*, Development Assistance Research Associates (New York: Palgrave Macmillan, September 2008), p. 83

[89] John Telford and John Cosgrave, *Joint Evaluation of the International Response to the Indian Ocean Tsunami: Synthesis Report* (London: Tsunami Evaluation Coalition, July 2006), p. 21. See also John Cosgrove, "Humanitarian Funding and Needs Assessment," in *The Human Response Index 2008: Donor Accountability in Humanitarian Action*, Development Assistance Research Associates (New York: Palgrave Macmillan, September 2008), p. 83. p. 63

Pakistan floods was $121.67, while for a victim of the Chilean earthquake there was funding of only $25.47 (almost 40 times less than the per capita amount in Haiti), and for a victim of Chinese floods the funding tracked by the UN Financial Tracking Service was $0.001 or almost 1 million times less than for an earthquake-affected person in Haiti (see Table 6).

TABLE 6* Disaster Funding Versus Disaster Damage[90]

Country/ Region	Disaster	Month	Disaster funding $ mil.	Disaster damage $ mil.	Funding/ damage%	Affected persons millions	Funding/ affected person $
Haiti	Earthquake	January	3,509	8,000	43.86	3.7	948.37
Pakistan	Floods	July, August	2,202	9,500	23.17	18.1	121.67
Chile	Earthquake	February	68	30,000	0.23	2.67	25.47
Central America	Tropical Storm Agatha	May	18	982	1.83	0.39	46.15
Myanmar	Tropical Cyclone Giri	October	18	No data	N/A	0.26	69.23
Mongolia	Cold Wave (Dzud)	April	13	62	20.97	0.77	16.88
China	Floods	June	0.15	18,000	0.001	134	0.001

*Top 6 funded disasters plus China floods (for complete data set see Table 10)

Even considering the fact those middle-income countries such as Chile and China might have sufficient means and capacities to deal with the consequences of major natural disasters and may therefore need less assistance or that some countries are reluctant to ask for/allow for international humanitarian aid, these ratios demonstrate a staggering inequality of responses.

FUNDING/DAMAGE RATIOS 2004–2010

The international humanitarian response to the Haiti earthquake and the Pakistani floods make 2010 the best-funded year in the recent past in terms of the ratio of international funding to estimated damage, with 5.42 percent of disaster damage covered by humanitarian funding in 2010. This is more than double the average of 2.10 percent for the period of 2004–2010. The only year with higher humanitarian funding in the recent past was 2005, where the response to the Indian Ocean tsunami was largely responsible for annual humanitarian funding of $7.62 billion compared to the $5.91 billion in funding in 2010. But because of the higher damage estimate in 2005, the funding to damage percentage was only 3.56 percent in 2005.

[90] OCHA, Financial Tracking Service, "Natural Disasters in 2010", 31 January 2011, http://fts.unocha.org/pageloader.aspx?page=emerg-emergencies&section=ND&Year=2010 and EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

TABLE 7 2004–2010 Humanitarian Disaster Funding Compared to Estimated Natural Disaster Damage

	FTS humanitarian disaster funding/year ($ billions)[91]	Estimated damage from natural disasters/year ($ billions)[92]	Funding/damage %
2004	0.59	136.20	0.43
2005	7.62	214.20	3.56
2006	0.26	34.10	0.76
2007	0.82	74.40	1.10
2008	1.40	190.50	0.73
2009	0.31	48.50	0.64
2010	5.91	108.50	5.42
Average	2.42	115.20	2.10

THE UN CENTRAL EMERGENCY RESPONSE FUND IN 2010

The Central Emergency Response Fund (CERF) is a humanitarian fund established by the United Nations in 2005 to enable more timely and reliable humanitarian assistance to those affected by natural disasters and armed conflicts. The CERF was approved by consensus by the United Nations General Assembly on 15 December 2005 to promote early action and response to reduce the loss of life, to enhance response to time-critical requirements, and to strengthen core elements of humanitarian response in underfunded crises.[93] The CERF's quick release of funds to provide humanitarian relief avoids the often slow process of receiving pledges and/or translating pledged money from donor governments into tangible contributions.

In 2010, the CERF dispersed $415.2 million in funding for both natural disasters and conflict situations, in comparison with $397.4 million in 2009. As Table 8 demonstrates, in 2010 the majority of funding went to countries affected by natural disasters, with Pakistan receiving the most funding, followed by Haiti and Niger. These three countries attracted almost 30 percent of all CERF funding in 2010. Although conflict-related funding was the biggest outlay of CERF's rapid response fund in 2010 with $81.2 million, climate-related emergencies came in a close second with $73.5 million. Earthquake-related funding by CERF was $53.5 million. Other major funding was disbursed for food security ($50.8 million) and for response to disease ($15 million).[94]

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91 OCHA, Financial Tracking Service, 31 January 2011, http://fts.unocha.org/

92 EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

93 OCHA, Central Emergency Response Fund, "What is CERF?", 2007, http://ochaonline.un.org/cerf/WhatistheCERF/tabid/3534/language/en-US/Default.aspx

94 OCHA, CERF, *CERF Activities in 2010*, January 2011

TABLE 8 UN Central Emergency Response Fund (CERF) – Top 5 Countries Receiving CERF Funds 2010[95]

Country	Funds allocated $	Percentage of total	For natural disaster-affected	For conflict-affected
Pakistan	51,832,831	12.48	Yes	Yes
Haiti	36,564,849	8.81	Yes	No
Niger	35,015,440	8.43	Yes	No
Congo, The Democratic Republic of the	29,126,626	7.01	No	Yes
Sudan	23,856,917	5.75	Yes	Yes
Total approved funding	415,200,000	100.00		

The CERF is an extremely important tool for rapid response and also for funding relief for emergencies that receive little donor interest, such as the drought in Niger in 2010. Overall strengthening CERF financially could be a positive step forward, as its distribution seems to be far less disproportionate than the distribution of humanitarian aid reflected in the UN's Financial Tracking Service (see above and Tables 6, 7 and 9).

MAKING SENSE OF IT ALL

The international humanitarian community engages many different actors, among them donor and recipient governments, militaries, Red Cross/Crescent societies, UN agencies, international and local NGOs, religious groups, the media, the private sector, diaspora groups, individual philanthropists, and even celebrities in a complex and often chaotic system. This multitude of actors coupled with the urgency to respond quickly and decisively leads to a variety of challenges, from difficulties in coordinating response on the ground to collecting data on basic indicators.

Even with the laudable efforts of EM-DAT, the OFDA/CRED International Disaster Database and OCHA's Financial Tracking Service in collecting statistics on natural disaster damages and funding, many of these estimates need to be approached with a critical eye. For example, as noted above, they do not include local contributions. Nonetheless, the data that are available reveal some of the trends in natural disaster occurrence and funding, including:

- 2010 was an average to above-average year with regard to the number and impact of natural disasters. The number of recorded disasters and affected persons was generally

[95] UN Central Emergency Response Fund, "Countries Receiving CERF Funds 2010", 27 January 2010, http://ochaonline.un.org/CERFFigures/CountriesreceivingCERFfunds/CountriesreceivingCERFfunds2010/tabid/6561/language/en-US/Default.aspx

in line with the average annual figures for the past decade while fatalities and economic damages were higher than average for the decade.

- Hydrometeorological and climatological disasters make up the vast majority of natural disasters, with 2010 being an extremely dangerous year in terms of floods and yet a safer one in terms of storms. Growing populations in most of the world's countries and predictions of more frequent and more intense hydrometeorological and climatological disasters due to climate change make it likely that even more people will be affected by such hazards in the future.
- Disaster funding is disproportionate and shows little relationship to either the number of affected persons or the amount of damage suffered. Over 95 percent of international funding in 2010 was directed towards two mega-disasters, the earthquake in Haiti and the floods in Pakistan, while other disasters such as the floods in China received almost no international humanitarian support.
- More analysis and discussion is needed about the effectiveness of international funding on those affected by natural disasters and about the relationship between funding of disaster response and disaster risk reduction. Given the challenges of a world experiencing the effects of a changing climate, it will be more important to ensure that international funds are not only well-spent but that they build on local capacities to reduce the effects of natural hazards on vulnerable populations. In particular, it seems evident that disaster risk reduction and disaster preparedness should receive greater attention and funding to minimize casualties and damage from future disasters.

TABLE 9 UN Financial Tracking Service, Humanitarian Natural Disaster Funding 2010[96]

	Amount ($ millions)	UN Appeal
HAITI – Earthquakes – January 2010	3,509	Yes
PAKISTAN – Floods – July 2010	2,202	Yes
CHILE – Earthquake – February 2010	68	
CENTRAL AMERICA – Tropical Storm Agatha – May 2010	18	Yes
MYANMAR – Tropical Cyclone Giri – October 2010	18	
MONGOLIA – Dzud Appeal – April 2010	13	Yes
MYANMAR – Flood – June 2010	13	
COLOMBIA – Floods and Landslide – September 2010	9.8	
CHINA – Earthquake – April 2010	7.3	
BENIN – Floods – July 2010	6.9	

[96] OCHA, Financial Tracking Service, "Natural Disasters in 2010", 31 January 2011, http://fts.unocha.org/pageloader.aspx?page=emerg-emergencies&section=ND&Year=2010

TABLE 9 UN Financial Tracking Service, Humanitarian Natural Disaster Funding 2010[96]

	Amount ($ millions)	UN Appeal
SRI LANKA – Floods – December 2010	6.7	Yes
PHILIPPINES – Typhoon Megi – October 2010	6.4	
BURKINA FASO – Floods – August 2010	6.1	Yes
INDONESIA – Sumatra Earthquakes and Tsunami – October 2010	5.3	
VIET NAM – Floods – October 2010	2.7	
BOLIVIA – Floods – January 2010	2.5	
CENTRAL/SOUTHERN EUROPE: Floods – Nov 2010	2.2	
FIJI – Tropical Cyclone Tomas – March 2010	1.9	
MADAGASCAR – Tropical Cyclone Hubert – March 2010	1.6	
CARIBBEAN – Hurricane Tomas – October 2010	1.4	
CENTRAL EUROPE – Floods – May 2010	1.3	
TOGO – Floods – October 2010	1.3	
AUSTRALIA – Floods – December 2010	1.1	
GAMBIA – Floods – September 2010	1.1	
CHINA – Land Slide – August 2010	1	
AFGHANISTAN – Floods – June 2010	0.7	
RUSSIAN FEDERATION – Wild Fire – July 2010	0.7	
SERBIA – Earthquake – November 2010	0.54	
ISRAEL – Wild Fire – December 2010	0.5	
BRAZIL – Floods and Landslides – December 2010	0.43	
MEXICO – Tropical Cyclone – June 2010	0.35	
UGANDA – Landslide – March 2010	0.3	
SRI LANKA – Floods – May 2010	0.29	
AFGHANISTAN – Floods and Avalanches – Feb 2010	0.27	
TAJIKISTAN – Flood – May 2010	0.26	
ETHIOPIA – Flood – July 2010	0.25	
VENEZUELA – Floods and Landslides – Nov 2010	0.22	
THAILAND – Flash Flood – October 2010	0.2	
PAKISTAN – Avalanche – February 2010	0.19	
GHANA – Flood – June 2010	0.16	
CHINA – Floods – June 2010	0.15	
BRAZIL – Floods and Landslides – April 2010	0.15	
SOLOMON ISLANDS – Earthquake – January 2010	0.13	
ROMANIA – Flood – June 2010	0.12	
BRAZIL – Floods – June 2010	0.1	

TABLE 9 UN Financial Tracking Service, Humanitarian Natural Disaster Funding 2010[96]

	Amount ($ millions)	UN Appeal
PAKISTAN – Landslide – January 2010	0.1	
PANAMA – Floods – November 2010	0.1	
BOSNIA AND HERZEGOVINA – Floods – June 2010	0.08	
PHILIPPINES – Flood – May 2010	0.08	
JAMAICA – Tropical Storm Nicole – September 2010	0.068	
PERU – Cold Wave – July 2010	0.056	
HUNGARY – Floods – May 2010	0.05	
MEXICO – Hurricane Karl – September 2010	0.05	
POLAND – Flash Floods – May 2010	0.05	
PORTUGAL – Flood – February 2010	0.05	
COSTA RICA – Floods – December 2010	0.014	
Total 2010	5,914.31	
Total Floods and Landslides	2,262.01	
Total Storms	47.77	
Total Earthquakes	3,590.27	
Total others (wildfires, cold waves)	14.26	
Total 2010	**5,914.31**	

CHAPTER 2: EARTHQUAKES AND FLOODS*

This chapter examines some of the similarities and differences between the two megadisasters of 2010: the 12 January earthquake in Haiti and the floods in Pakistan which began in July. Throughout the year, much of the commentary has focused on possible reasons for the disproportionate donor response to the two disasters. But there are other comparisons and contrasts between the two cases that deserve further attention. This chapter looks first at the differences in the nature of the disasters, followed by an assessment of the housing needs and displacement caused by the two disasters, as well as the international responses they generated. To frame this analysis, the table below provides a starting point for comparing key indicators.

SECTION 1: COMPARING THE EARTHQUAKE IN HAITI AND THE FLOODS IN PAKISTAN – BASIC INDICATORS

Table 1 provides information on some basic indicators of the scale of the disasters in Haiti and Pakistan, the problems encountered, and the international response.

DATA LIMITATIONS

While the date—indeed even the exact moment—of the Haitian earthquake is clear, it is difficult to isolate the precise date when the Pakistani flooding could be classified as having become a major disaster. The following analysis of the floods is based on a starting date of 29 July, which is when the UN's Office of Humanitarian Affairs issued its first situation report. However, this is far from a precise indicator, as discussed below. Assessments of the extent of the damage in Pakistan were ongoing in 2011, complicating efforts to compare international funding for the disasters.

* An earlier version of this chapter appeared on the Brookings website: Elizabeth Ferris, *Earthquakes and Floods: Comparing Haiti and Pakistan,* Brookings-Bern Project on Internal Displacement, August 2010, www.brookings.edu/~/media/Files/rc/papers/2010/0826_earthquakes_floods_ferris/0826_earthquakes_floods_ferris.pdf

TABLE 1 Comparison of Basic Indicators, Haiti Earthquake and Pakistan Floods

	Haiti earthquake	Pakistan floods
Date of disaster	12 Jan 2010 First OCHA Situation Report: January 12[i]	Late July 2010 (First reports of flash floods in Balochistan on July 23, floods in KPK starting around July 26/27) First OCHA Situation Report: July 29[ii]
National population 2009	10 million[iii]	169.7 million[iv]
Deaths	316,000[v]	1,985[vi]
Injured	Over 300.000[vii]	2,946[viii]
Displaced	Est. 1.8 million (1.3 within Port-au-Prince, 500.000 leaving Port-au-Prince)ix	Est. 6 million in need of shelter[x] (August 23)
Total affected/as percentage of total national population	3 million (30 %)[xi]	20.1 million[xii] (11.84 %)
Houses destroyed/damaged	188,383[xiii]	913,307/694,878[xiv]
Schools destroyed/damaged	1,300[xv]	10,044[xvi]
Hospitals/health facilities destroyed/damaged	50[xvii]	588[xviii]
Original UN Flash appeal launched	15 January:[xix] $575 million	11 August:[xx] $460 million

[i] OCHA, Haiti, "Earthquake Situation Report #1", 12 January 2010, http://www.reliefweb.int/rw/rwb.nsf/db900SID/MUMA-7ZN76X?OpenDocument

[ii] OCHA, "Situation Report: Monsoon Floods in Pakistan – 29 July 2010", 29 July 2010, http://www.unhabitat.org.pk/newweb/Latest%20Reports/OCHA%20Situation%20Reports/SITREP_FLOODS%20IN%20PAKISTAN_29%20July.pdf

[iii] World Bank, "World Development Indicators, Haiti", http://data.worldbank.org/country/haiti

[iv] World Bank, "World Development Indicators, Pakistan", http://data.worldbank.org/country/pakistan

[v] New York Times, "Haiti: Quake's Toll Rises to 316,000", 13 January 2011, http://www.nytimes.com/2011/01/14/world/americas/14briefs-Haiti.html

[vi] National Disaster Management Agency, 16 January 2011, http://www.pakistanfloods.pk/daily-updates/situation-report

[vii] Government of Haiti, Post Disaster Needs Assessment (PDNA)

[viii] National Disaster Management Agency, 16 January 2011, http://www.pakistanfloods.pk/daily-updates/situation-report

[ix] Government of Haiti, Post Disaster Needs Assessment (PDNA)

[x] UN, http://www.un.org/apps/news/story.asp?NewsID=35687&Cr=pakistan&Cr1=

[xi] CNN, http://www.cnn.com/2010/WORLD/americas/01/13/haiti.earthquake/index.html

[xii] OCHA, "Situation Report Monsoon Floods" No. 16, 23 August 2010

[xiii] OCHA, Haiti Humanitarian Bulletin # 11, 12 October 2010, http://www.reliefweb.int/rw/rwb.nsf/db900sid/RMOI-8ACV4Z/$File/full_report.pdf

[xiv] Asian Development Bank, World Bank, "Pakistan Floods 2010:Preliminary Damage and Needs Assessment", November 2010, http://siteresources.worldbank.org/PAKISTANEXTN/Resources/293051-1264873659180/6750579-1291656195263/PakistanFloodsDNA_December2010.pdf

[xv] PDNA

[xvi] OCHA, "Pakistan Humanitarian Bulletin 2", 14 October 2010, http://www.pakresponse.info/LinkClick.aspx?fileticket=WqWp8hNfjdw%3d&tabid=96&mid=703

[xvii] PDNA

[xviii] Islamic Relief USA, "Pakistan Flood Emergency", http://www.islamicreliefusa.org/pakistan-floods

[xix] ALNAP, "Haiti Earthquake Response, Context Analysis", 20 June 2010, http://www.alnap.org/pool/files/haiti-context-analysis-final.pdf

[xx] IPS, " 460 Million Dollars Sought for Pakistan Flood Relief", 11 August 2010, http://ipsnews.net/news.asp?idnews=52464

TABLE 1 Comparison of Basic Indicators, Haiti Earthquake and Pakistan Floods

	Haiti earthquake	Pakistan floods
Donation per affected person received after 2 weeks of flash appeal	$157.16	$15.24
International pledges 2 weeks after flash appeal as percent of total appeal	82%[xxi]	57%[xxii]
Flash appeal funded 100 %	16 February (35 days)[xxiii]	24 September (44 days)[xxiv]
Revised Humanitarian Appeal	$1.4 billion for 1 year Launched 18 February (includes the $575 million of the flash appeal)[xxv]	$2.0 billion for 1 year Launched 17 September (includes the $460 million of the flash appeal)[xxvi]
Funding of revised appeal two months after flash appeal/total % funded	$703 million (49%)[xxvii]	$688.6 million (34%)[xxviii]
Funding of revised appeal five months after flash appeal/total % funded	$843 million (57%)[xxix]	$1,037 million (53%)[xxx]
Appeal by International Federation of the Red Cross/ Crescent Society	$103 million	$74 million
Number of tents/plastic sheets distributed 3 weeks after	10,545/11,390 (February 3)[xxxi]	109,500/72,200 (August 23)[xxxii]
% of displaced receiving tents/ tarpaulins (after 3 weeks)	0.017 tents/tarpaulins per targeted displaced person (1.3 million)	0.03 tents/tarpaulins per person in need of shelter (6 million)
Number of tents/plastic sheets distributed 2 months after	35,000/259,266 (March 15)[xxxiii]	261,498/439,745 (October 14)[xxxiv]

[xxi] OCHA, "Haiti Earthquake Situations Report No 15", 29 January 2010
[xxii] OCHA, "Situation Report Monsoon Floods No. 16", 23 August 2010
[xxiii] ALNAP, "Haiti Earthquake Response, Context Analysis", 20 June 2010, http://www.alnap.org/pool/files/haiti-context-analysis-final.pdf
[xxiv] OCHA, "Situation Report Monsoon Floods No. 27", 24 September 2010
[xxv] OCHA, "Haiti Revised Humanitarian Appeal", 18 February 2010, http://ochaonline.un.org/humanitarianappeal/webpage.asp?Page=1843
[xxvi] OCHA, "Pakistan Floods Emergency Response Plan 2010", 17 September 2010, http://ochaonline.un.org/humanitarianappeal/webpage.asp?Page=1898
[xxvii] OCHA, "Haiti Earthquake Situation Report No 29", 15 March 2010, http://www.reliefweb.int/rw/RWFiles2010.nsf/FilesByRWDocUnidFilename/EGUA-83LQHF-full_report.pdf/$File/full_report.pdf
[xxviii] OCHA, "Pakistan Humanitarian Bulletin 2", 14 October 2010, http://www.pakresponse.info/LinkClick.aspx?fileticket=WqWp8hNfjdw%3d&tabid=96&mid=703
[xxix] OCHA, "Haiti Earthquake Humanitarian Bulletin # 3", 24 May, 2010, http://www.reliefweb.int/rw/RWFiles2010.nsf/FilesByRWDocUnidFilename/VVOS-85RPLG-full_report.pdf/$File/full_report.pdf
[xxx] OCHA, "Pakistan Humanitarian Bulletin No 12", 6 January 2011
[xxxi] OCHA, "Haiti Earthquake Situation Report No 17", 3 February 2010
[xxxii] OCHA, "Situation Report Monsoon Floods No 16", 23 August 2010
[xxxiii] OCHA, "Haiti Earthquake Situation Report No 29", 15 March 2010
[xxxiv] OCHA, "Pakistan Humanitarian Bulletin 2", 14 October 2010

TABLE 1 Comparison of Basic Indicators, Haiti Earthquake and Pakistan Floods

	Haiti earthquake	Pakistan floods
% of displaced receiving tents/ tarpaulins (2 months after)	0.23 tents/tarpaulins per targeted displaced person (1.3 million) 63 % of targeted population (UN OCHA)[xxxv]	0.11 tents/tarpaulins per person in need of shelter (6 million) 25 % of targeted population (UN OCHA)[xxxvi]
Number of tents/plastic sheets distributed 4 months after	45,000/376,000[xxxvii] (April 12)	352,000/690,000[xxxviii] (December 8)
Number of emergency shelters constructed	350 of 130,000 T-shelters (0.27 % completed approx. 5 months after quake)[xxxix] 39,219 of 110,440 T-shelters completed (35 % completed 12 months after quake)[xl]	2,042 of 79,581 one-room shelters, 7,977 of 53,711 transitional shelters completed (2.57 and 14.75 % completed approx. 5 months after floods)[xl1]
IDP camps/sites	1,555[xlii] (July) 1,199[xliii] (November)	4,788[xliv] (October) 188[xlv] (January 2011)
IDPs in camps	1,536,447[xlvi] (July) 1,058,853[xlvii] (November)	1,800,000[xlviii] (September) 124,164[xlix] (January 2011)

[xxxv] OCHA, Haiti Earthquake Situation Report No 29, 15 March 2010
[xxxvi] OCHA, "Pakistan Humanitarian Bulletin 2", 14 October 2010
[xxxvii] OCHA, "Haiti Earthquake Situation Report # 33", 12 April 2010, http://www.cinu.org.mx/haiti/docs/OCHASituationReportNo33Haiti%20Earthquake12April2010.pdf
[xxxviii] IASC , Pakistan Floods Shelter Cluster, Pakistan Floods after 4 months, 8 December 2010, https://8688533516853954526-a-1802744773732722657-s-sites.googlegroups.com/site/shelterpak2010/home/101208_pakistanresponse-graphic.jpg?attachauth=ANoY7cpr9lDVyopxAppjncBpRzETBRFD-mpx2b_zRb_7-6TPg6a2__YAVyGh05X_tzqrCJENpy0O8XxVE-W4Qqp2VcDJKrIFtZHdSeave-QdIm5ecIBQgQj2ZG_-e0T5NwigUsnt2ZdVX0bbPywr2I8Ksxeptj41oQPnjZ9K0gOpqcDdKFIvGG56omXyo0ov0isg671fjmyG_oU2fFOvjN0PrQSE1fYO4JKpO04w7B1onxVKlbP8KJc%3D&attredirects=0
[xxxix] OCHA, "Haiti Humanitarian Bulletin # 2", 5 May 2010
[xl] Haiti Shelter Cluster, SHELTER Completion update as of 10 January 2011, https://1167483888581526295-a-1802744773732722657-s-sites.googlegroups.com/site/shelterhaiti2010/files/TOTALSHELTER_SCupdate_10jan2011.PDF?attachauth=ANoY7coTKn7OSsapPfoBQnKojUDg53uzKFPncgPEyjViBhC8iwTiI-TCLtR7LGuc6a8P1kAQd-t2qkE1uzQw1G-2CZ_5QvNbFgL_u9CBbwwHnuWSjyZWJJYgHsNbeqy-o3cWVWUiuAmZCj8wrkAAC3jGgFmNewy7bHjEKNMcxyYt7BNaAY_2jsGmoKZgB2JO8fC15ysc51Es64cFRN6TDxPWR6b-PeTsQBbmk-Dzu-nVl0NsL3Er5nM%3D&attredirects=0
[xli] OCHA, "Pakistan Humanitarian Bulletin # 13", 12–20 January 2011, http://pakresponse.info/LinkClick.aspx?fileticket=0E7NhNPU2P0%3d&tabid=87&mid=760
[xlii] Haiti Camp Coordination Management Cluster, "Displacement Tracking Matrix: V 2.0 update", 9 December 2010
[xliii] Haiti Camp Coordination Management Cluster, "Displacement Tracking Matrix: V 2.0 update", 9 December 2010
[xliv] OCHA, "Pakistan Humanitarian Bulletin 2", 14 October 2010
[xlv] OCHA, "Pakistan Humanitarian Bulletin # 13", 12–20 January 2011
[xlvi] Haiti Camp Coordination Management Cluster, "Displacement Tracking Matrix: V 2.0 update", 9 December 2010
[xlvii] Haiti Camp Coordination Management Cluster, Displacement Tracking Matrix: V 2.0 update", 9 December 2010
[xlviii] OCHA, Pakistan Monsoon Floods, "Situation Report # 23", 9 September 2010,
[xlix] OCHA, "Pakistan Humanitarian Bulletin # 13", 12–20 January 2011

TABLE 1 Comparison of Basic Indicators, Haiti Earthquake and Pakistan Floods

	Haiti earthquake	Pakistan floods
Role of US military	Deployed 22,268 troops (at peak in February 2010), more than 300 aircraft and helicopters; 23 ships including the hospital ship USNS Comfort; initially controlled airport; rehabilitated the harbor; distributed aid;[l]	26 helicopters in Pakistan and more offshore[li]; as of October 14, 2010[lii] the U.S. military had delivered 16 million pounds of relief supplies and food, and helicopters had rescued or transported about 22,000 people;
Health concerns	Traumatic injuries, including crushing Injuries; high needs for surgery; infections; cholera epidemic;	Water-borne illnesses (diarrhea, cholera); skin-disease; acute respiratory disease; malaria; dengue fever;
Protection concerns	Trafficking of children; gender-based violence in camps; general insecurity; forced evictions of IDPs;	Early reports of separated families; discrimination against lower castes, women-headed households;
Shelter concerns	Land tenure issues; slow debris clearance; lack of reconstruction master plan;	Land markers washed away by floods; mud removal;
Political concerns	Election schedule and election crisis; limited government capacity (weak overall capacity before the quake, augmented by death of many government officials);	Potential strengthening of fundamentalist groups; destabilization and delegitimization of government; interference of conflict with disaster response;
Economic concerns	70% of Haiti's GDP is generated in the Port-au-Prince area which was most heavily impacted by the disaster; massive destruction of housing and infrastructure;	Massive destruction of infrastructure; agriculture most affected sector with estimated $5 billion in losses, especially in crops but also widespread loss of livestock; high inflation;
Logistics	Destroyed airport, harbor, roads; Generally poor infrastructure even before earthquake: roads, water, sewage and garbage disposal; 20 million cubic meters of debris[liii];	Destroyed roads, bridges; some areas only accessible by helicopter; 20% of the country flooded, with some areas flooded for months;

[l] United States Southern Command, "Helping Haiti: Narrative History of Operation Unified Response" (as of 25 May 2010), http://www.southcom.mil/appssc/factFilesLarge.php?id=138

[li] US Department of State, "Update: U.S. Response to Pakistan's Flooding Disaster", http://www.state.gov/r/pa/prs/ps/2010/10/149486.htm

[lii] New York Times, "In Flood-Isolated Regions of Pakistan, U.S. Military Presents a Humanitarian Face", 14 October 2010, http://www.nytimes.com/cwire/2010/10/14/14climatewire-in-flood-isolated-regions-us-military-presen-40128.html?pagewanted=3

[liii] UNDP, Program Outline: Debris Management, http://www.undp.org/haiti/doc/CN_2_DebrisMgmt-E-s.pdf

TABLE 1 Comparison of Basic Indicators, Haiti Earthquake and Pakistan Floods

	Haiti earthquake	Pakistan floods
Total GDP 2009[liv]	$6.5 billion	$166.5 billion
GDP per capita 2009 nominal[lv]	$733	$1,017
Estimated Damage	$7.8 billion[lvi]	Est. $8.74–10.85 billion[lvii]
Estimated Damage as percentage of GDP	119%	5.2–6.5%
Reconstruction Pledges	March 31 – Donors pledge $9.9 billion of which $5.3 billion is pledged over 2 years (requested $3.9 billion)	Aug. 22 – World Bank $0.9 billion; Asia Development Bank $2.0 billion (loans)
Corruption Perception Index 2009 (out of 180)[lviii]	160	139
HDI 2009[lix] (out of 182)	149	141
International Media stories 10 days after the disaster[lx]	More than 3,000 stories in both print and broadcast media respectively by day 10 and by day 20	320 broadcast news stories and 730 print news stories
Top 10 donors (total humanitarian assistance, excluding uncommitted pledges)	Private (individuals & organizations) $1,245.2 m United States $1,178.1 m Canada $163 m European Commission $142.9 m Red Cross/Red Crescent $86.5 m Spain $77.8 m Japan $71.6 m Saudi Arabia $50.0 m Central Emergency Response Fund $38.5 m Sweden $37.3 m **Total $3.5 billion**[lxi] (excl. $1.0 billion uncommitted pledges)	United States $671.5 m Private (individuals & organizations) $321.7 m European Commission $183.6 m Saudi Arabia $151.3 m United Kingdom $114.7 m Australia $72.0 m Canada $68.2 m Germany $47.7 m Central Emergency Response Fund $42.0 m Sweden $41.0 m **Total $2.2 billion**[lxii] (excl. $416 million uncommitted pledges)

[liv] IMF, World Economic Outlook Database, April 2010

[lv] IMF, World Economic Outlook Database, April 2010

[lvi] Government of Haiti, Post Disaster Needs Assessment (PDNA)

[lvii] Asian Development Bank, World Bank, Pakistan Floods 2010: Preliminary Damage and Needs Assessment, November 2010, http://siteresources.worldbank.org/PAKISTANEXTN/Resources/293051-1264873659180/6750579-1291656195263/PakistanFloodsDNA_December2010.pdf

[lviii] Transparency International, Corruption Perceptions Index 2009, http://www.transparency.org/policy_research/surveys_indices/cpi/2009/cpi_2009_table

[lix] UNDP, Human Development Index, http://hdr.undp.org/en/statistics/

[lx] Winthrop, An Estimated 20 Million Pakistanis in Desperate Need: Why So Little Media Attention?, http://www.brookings.edu/opinions/2010/0818_pakistan_flood_winthrop.aspx

[lxi] OCHA, Financial Tracking Service, "HAITI - Earthquakes - January 2010, Table B: Total Humanitarian Assistance per Donor (Appeal plus other*)" as of 20 January 2011 http://fts.unocha.org/reports/daily/ocha_R24_E15797___1101200204.pdf

[lxii] OCHA, Financial Tracking Service, "PAKISTAN – Flood – July 2010, Table B: Total Humanitarian Assistance per Donor (Appeal plus other*)" as of 20 January 2011, http://fts.unocha.org/reports/daily/ocha_R5_A905___1101200204.pdf

TABLE 1 Comparison of Basic Indicators, Haiti Earthquake and Pakistan Floods

	Haiti earthquake	Pakistan floods
Top 10 donors (emergency appeal)	Private (individuals & organizations) $284.7 m United States $243.1 m Canada $88.7 m European Commission $67.7 m Saudi Arabia $50.0 m Japan $42.6 m Spain $40.8 m Red Cross / Red Crescent $39.6 m Central Emergency Response Fund (CERF) $38.5 m Brazil $28.2 m **Total $1,106.9 million**[lxiii] (excl. $2.8 million uncommitted pledges)	United States $416.2 m Japan $123.9 m European Commission $93.2 m United Kingdom $74.2 m Private (individuals & organizations) $67.2 m Canada $42.8 m Central Emergency Response Fund (CERF) $41.98 m Australia $37.7 m Norway $36.5 m Sweden $30.1 m **Total $1,102.2 million**[lxiv] (excl. $93.4 million uncommitted pledges)
Top pledges (Donor's conference)	Venezuela $2,417 m Inter-American Development Bank $2,000 m USA $1,152 m European Commission $567 m IMF $436 m Spain $427 m World Bank $399 m Canada $387 m InterAction members $322 m 10. IFRC/RCS $300 m **Total $10.19 billion**[lxv]	

[lxiii] OCHA, Financial Tracking Service, "Flash Appeal: Haiti Revised Humanitarian Appeal (January – December 2010)", as of 20 January 2011, http://fts.unocha.org/reports/daily/ocha_R5_A893___1101200204.pdf

[lxiv] OCHA, Financial Tracking Service, "Flash Appeal: Pakistan Floods Emergency Response Plan (August 2010 – July 2011)", as of 20 January 2011, http://fts.unocha.org/reports/daily/ocha_R5_A905___1101200204.pdf

[lxv] Haiti Reconstruction Platform, Government of the Republic of Haiti, "Pledge List", http://www.refondation.ht/index.jsp?sid=1&id=191&pid=126

SECTION 2: EARTHQUAKES AND FLOODS – HUMANITARIAN CHALLENGES

Globally, between 2000 and 2009, 2 billion people were affected by disasters. 44 percent of those were affected by floods, 30 percent by drought and only 4 percent by earthquakes. However, since 2000, 60 percent of those killed in disasters have died in earthquakes.[97] In comparison with hydrometeorological disasters such as the floods in Pakistan, where the main threats to life are drowning and in some cases, electrocution and/or ensuing landslides, earthquakes pose particular difficulties:[98]

- Risk of aftershocks, causing further traumatization and complicating relief efforts;
- Damage to infrastructure, collapsed buildings and rubble which may pose serious obstacles to relief efforts;
- Higher potential for serious injuries requiring immediate care and longer-term rehabilitation, such as crush injuries and broken bones;
- Difficulties in mobilizing support to reduce future risks, as in many regions earthquakes are less likely to occur than other disasters.

ONSET

Most obviously, earthquakes occur suddenly and with little warning—meaning that people cannot be evacuated in advance of an earthquake. Efforts instead tend to focus on risk mitigation of earthquakes, such as enforcing safer building codes and educating the population on how to respond when tremors occur. While flooding usually builds up more slowly, it can also occur suddenly, particularly after heavy rainfall or the collapse of a dam. But large-scale flooding is usually the result of sustained heavy rains over a period of time which causes rivers to gradually swell and overflow their banks. This is what happened in Pakistan beginning in July. Although it received little coverage in the Western mainstream media, this is what happened in China as well—where flooding of the Yangtze, Yellow and Songhua Rivers forced the evacuation of millions of people, affected more than 134 million people and destroyed over 600,000 homes.[99]

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[97] Integrated Regional Information Networks (IRIN), "Earthquakes: the Decade's Deadliest Killer," 28 January 2010, http://www.irinnews.org/Report.aspx?ReportId=87908

[98] Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP), *Responding to Earthquakes 2008—Learning from Earthquake Relief and Recovery Operations*, July 2008, http://www.alnap.org/pool/files/ALNAPLessonsEarthquakes.pdf

[99] International Federation of the Red Cross, "China – Worst Flooding in Decades Leaves Millions in Need", 23 July 2010, http://www.reliefweb.int/rw/rwb.nsf/db900sid/ASHU-87MS36?OpenDocument&rc=3&cc=chn

URBAN VS. RURAL IMPACT

When earthquakes strike, it is the location of a quake's epicenter which is the main determinant of the level of destruction. But no matter where the epicenter is located, urban areas are typically more vulnerable than rural zones because they are more built-up and densely populated. The massive destruction caused by the earthquake in Port-au-Prince, the capital in Haiti, is a prime example of urban vulnerability to earthquakes, especially in countries that are vulnerable to earthquakes but do not have or enforce strict building codes requiring earthquake-resistant buildings. In the case of Pakistan's 2005 earthquake, while the epicenter was in a rural area, most of the 73,000 casualties were people living in small towns and cities.[100]

Given rising urbanization it is likely that disasters will become increasingly urban phenomena. Growing cities often mean that people are living on increasingly marginal land and in informal settlements with poor housing conditions, making them more susceptible to the effects of natural hazards. The UN Population Division predicts that almost all the world's population growth in the next few decades will take place in urban areas in low-income and middle-income nations.[101]

For international humanitarian agencies, working in urban contexts is generally more difficult than working in rural areas because of the presence and sometimes overlapping authority of different national and municipal entities and the presence of many civil society organizations. Humanitarians have a lot more freedom of action in rural areas than they do in cities, particularly in capital cities.[102]

AGRICULTURE AND LIVESTOCK

Whereas major earthquakes primarily tend to disrupt agricultural production due to damaged transportation and economic infrastructure, flooding often destroys crops as well as livestock, equipment and seeds. Even once flood waters subside, the land may be unsuitable for agricultural production for a period of time. Livestock, which is almost always lost in major flooding, is a particularly valued resource in rural communities for the income or labor it provides.[103]

In Pakistan, the Preliminary Damage and Needs Assessment estimates are that 14 percent of agricultural income was destroyed by the floods, which means damages of about $5 billion, mostly to

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100 Inter-Agency Standing Committee, *Meeting Humanitarian Challenges in Urban Areas (MHCUA): Draft Assessment*, 2 October 2009

101 IFRC, *World Disaster Report 2010—Focus on Urban Risk,* 2010, http://www.ifrc.org/Docs/pubs/disasters/wdr2010/WDR2010-full.pdf, p. 12

102 Inter-Agency Standing Committee, *Meeting Humanitarian Challenges in Urban Areas (MHCUA): Draft Assessment*, 2 October 2009, See also: IFRC, *World Disaster Report 2010, Focus on Urban Risk*, 2010, http://www.ifrc.org/Docs/pubs/disasters/wdr2010/WDR2010-full.pdf

103 As discussed in Chapter 3, this is also a factor in volcanic eruptions

crops but also to livestock and the fishing industry.[104] Moreover, Pakistan faces major export losses because of the destruction of export crops such as wheat and cotton. Damage to irrigation systems and loss of equipment and seeds also heavily impacted the wheat planting season, which began in September and although strong efforts are being made to revitalize agriculture in Pakistan, it is likely to take years until prior levels of productivity are reached. In contrast, typical results following an earthquake may include the destruction of agricultural land or crops remaining unharvested because fields become inaccessible. For the most part, however, the basic productivity of the land is not significantly affected in the aftermath of an earthquake.

RESCUE EFFORTS AND HUMANITARIAN ACCESS

The resources required to rescue people in the immediate aftermath of an earthquake are different than those needed in situations of wide scale flooding. In earthquakes, the immediate challenge is finding survivors buried under rubble, whereas in large-scale flooding, the most urgent need is to evacuate people from rooftops, trees, and other places where they have sought protection from the rising water. Earthquakes require heavy equipment to remove debris and search and rescue teams while flooding primarily requires helicopters and boats. When the capacity of national authorities to meet these needs is overwhelmed—as is usually the case in a major disaster—equipment and specialized teams must be brought in from outside the country. And in spite of the best political will, solidarity and planning in the world, this always takes time. Following the earthquake in Haiti, most of the survivors removed from the rubble were rescued by untrained civilians—family, neighbors and other members of the community. The 67 international rescue teams that arrived after the disaster only managed to rescue 132 persons.[105] Accounts from Pakistan indicated that many of those who escaped the flooding did so on their own accord without transport or support from either the Pakistani authorities or the international community. There is an important lesson in this: strengthening the ability of local communities to respond to disasters is likely to save many more lives than an equivalent amount of resources spent on deploying expensive international assets.

Access by humanitarian workers to people in need is almost always a challenge in natural disaster response, in large part due to the destruction of transportation infrastructure. In Haiti and Pakistan, access to vulnerable populations was slow. In Haiti, access was impeded largely by the presence of millions of tons of rubble and the widespread destruction of roads. In Pakistan, difficulties in accessing affected communities was primarily caused by inundation of the countryside, with many roads and bridges damaged or washed away by rising water levels.

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[104] Asia Development Bank, World Bank, *Pakistan Floods 2010:Preliminary Damage and Needs Assessment*, November 2010

[105] USA Today, "U.N.: Haiti Calls Off Search and Rescue", 23 January 2010, http://www.usatoday.com/news/world/2010-01-23-haiti-saturday_N.htm

PROTECTION NEEDS

In earthquakes and in floods, as in all major disasters, affected communities also have protection needs. Immediately after a disaster, however, the typical humanitarian response is to focus on rescue efforts and delivery of basic, life-saving assistance rather than to consider issues of protection. However, this is beginning to change with the adoption of the *Operational Guidelines on the Protection of Persons in Situations of Natural Disasters*[106] and the introduction of a cluster to coordinate protection activities in natural disasters.

In the case of Haiti, the problems of separated children, human trafficking, sexual and gender-based violence and overall violence in the camps, have continued to be major issues more than one year after the earthquake. In Pakistan, reports of protection problems also surfaced and included reports of separated children, discrimination by caste in the provision of assistance, gender-based violence often connected to the lack of safe spaces and to the ability of women to maintain *purdah*, or seclusion from men—a human rights violation in and of itself. In addition, there were a few cases in which landmines dislodged by the flooding killed children. Several months after the floods, protection concerns have mostly been based on access to assistance related to lost documentation, and child protection concerns such as trafficking, child labor and early marriages.[107]

THE PARTICULAR NEEDS FOR SHELTER

Survivors of both earthquakes and floods face immediate and long-term needs for shelter. National authorities and international agencies usually provide tents or plastic sheeting as temporary accommodations and subsequently plan for transitional and longer-term housing. Rebuilding after a major earthquake in an urban area requires the removal of rubble. In Haiti, one year after the earthquake the UN resident co-ordinator Nigel Fisher estimates that 10 to 15 percent of the rubble has been cleared, while some other estimates are as low as 5 percent.[108] When an earthquake occurs in a rural area, as in Pakistan in 2005, the issues are different—it is less about getting rubble out of crowded streets than about logistical difficulties of distributing materials and equipment for people to rebuild their own, usually modest, homes. In the case of large-scale flooding in rural areas—except in rare cases where the floods carry toxic materials—people can return to their homes once floodwaters recede, but often find them filled with mud and debris and their possessions destroyed.

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106 Brookings-Bern Project on Internal Displacement, *IASC Operational Guidelines on the Protection of Persons in Situations of Natural Disasters*, January 2011

107 Protection Cluster, *Rapid Protection Assessment, Northern and Southern Sindh, Pakistan*, November 2010

108 Globe and Mail, "Land disputes and rubble have stalled the job of rebuilding Haiti", 12 January 2011, www.theglobeandmail.com/news/world/project-jacmel/haiti-one-year-later/land-disputes-and-rubble-have-stalled-the-job-of-rebuilding-haiti/article1868017/ See also: Time, "Haiti's Quake, One Year Later: It's the Rubble, Stupid!", 12 January 2011, www.time.com/time/world/article/0,8599,2041877,00.html

The time of year in which the disaster occurs is a major factor in shelter arrangements. The Haiti earthquake occurred six months before the beginning of the country's hurricane season, providing an impetus to plan for shelter provisions in order to withstand the effects of torrential rains. However, when this deadline was not met, humanitarian agencies sought to prepare communities living under plastic sheeting on how to respond in the event of a hurricane.[109] Fortunately, in 2010 most hurricanes bypassed Haiti. The most serious storm to hit the island was Hurricane Tomas in November which flooded parts of Port-au-Prince and damaged tents and tarps in IDP camps. However, casualties were lower than feared, primarily because of the non-direct trajectory of the storm and efforts to prepare the population.

The 2005 earthquake in Pakistan, which occurred in the mountainous northern part of the country, took place in October, while the heaviest part of the flooding in Pakistan took place during July and August 2010. Consequently, after the earthquake in 2005, the drive of the humanitarian community was to provide "winterized" tents in advance of the coming snowstorms, while the recent flooding in Pakistan initially did not carry with it quite the same urgency because there were still several months before the onset of winter. Still, in mountainous areas, winterization of shelter and provision of winter clothes were important tasks of the humanitarian agencies in the latter months of 2010.

One of the biggest problems in rebuilding housing is the question of land titles and ownership. While temporary shelters and tents can often be erected on public property or on land rented from private owners, questions of ownership are key when it comes to transitional or permanent housing. Building homes for people who do not have clear titles to the land is fraught with potential conflict. Similarly, compensating individuals for lost homes can create resentment from others who do not receive the same compensation, particularly when ownership over the land in question is disputed. Moreover, many of those who lose homes are not homeowners, but rather renters and squatters—an issue addressed in Chapter 4 of this publication. Their needs also must be considered in rebuilding plans. In Haiti, the question of land ownership and titles is nightmarishly complex and has been the major impediment to large-scale reconstruction of housing.[110] In Pakistan, many of those affected by the floods hold only customary title to their lands; reports are that in some cases men remained on their flooded property in order to protect their claims to it. Further complicating the issue, flooding and earthquakes can alter traditional landmarks, rendering it difficult to accurately delineate or prove ownership.[111]

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109 OCHA Haiti, *Humanitarian Bulletin*, Issue # 9, 17 August 2010, p. 1

110 Elizabeth Ferris, Daniel Petz, *Haiti Six Months On,* 12 July 2010, http://www.brookings.edu/papers/2010/0712_haiti_six_months_ferris.aspx

111 Refugees International, "Refugees International Statement On Pakistan: More Protection Needed," 19 August 2010, http://www.refugeesinternational.org/press-room/press-release/refugees-international-statement-pakistan-more-protection-needed

DISPLACEMENT

Natural disasters are the greatest cause of population displacement: 38 million people were displaced globally after sudden-onset natural disasters in 2008 in comparison with 27.1 million internally displaced by conflicts and 10.4 million refugees registered with UNHCR who fled conflict and persecution.[112] Displacement resulting from natural disasters tends to be temporary and internal (within the country's borders). As citizens or habitual residents of their countries, IDPs do not lose their basic human rights when they are displaced, as spelled out in the UN *Guiding Principles on Internal Displacement*. It is the responsibility of national authorities to see that they are assisted and protected.

In both Haiti and Pakistan, large numbers of people were forced to flee their homes because their houses were destroyed or unsafe due to damage caused by the earthquake or by flood waters. The *Guiding Principles*[113] indicate that when people are obliged to flee their communities because of natural disasters, they are internally displaced persons, but experiences in both Haiti and Pakistan reveal that there are some gray areas in this definition. Losing one's physical home is not the same as being displaced. In Haiti, many of those who lost homes were able to set up makeshift shelters on or near their property or destroyed homes. They were homeless but not displaced. Similarly in Pakistan, there were people who were displaced by the flooding, but who were able to return when the waters subsided. And not all of those who were displaced had their homes totally destroyed. They can therefore be considered displaced, but not homeless.

While the displaced are also in need of shelter, this is far from their only need. Much of the trauma of displacement is related to the loss of social networks, the need to access new schools and health services and to develop relationships with a host community which differs (to varying degrees) from their community of origin. For the homeless who remain within their community, the challenge is much more the physical reconstruction of their homes than the need to establish new social relationships in a new community and to be able to access public services without the obstacles that often come from displacement. But the danger is that if temporary or transitional shelter is insufficient and homes are not rebuilt in a timely fashion, the homeless may leave their communities in search of better options and join the ranks of the displaced. This happened in the case of Haiti where there have been reports that many urban poor moved to IDP camps and spontaneous settlements in the hope of accessing assistance.[114] The disasters in Haiti and Pakistan illustrate the need to rethink the nature of disaster-induced displacement and for the humanitarian community to develop responses which are appropriate to the particular needs of the affected population, whether displaced or not.

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[112] UNHCR, *2009 Global Trends: Refugees, Asylum-seekers, Returnees, Internally Displaced and Stateless Persons*, 15 June 2010, available at: http://www.unhcr.org/4c11f0be9.html. IDMC/OCHA, *Monitoring disaster displacement in the context of climate change,* available at: http://www.internal-displacement.org

[113] UN, *Guiding Principles on Internal Displacement*, E/CN.4/1998/53/Add.2, 11 February 1998, available at: www.brookings.edu/projects/idp.aspx

[114] Elizabeth Ferris, "Haiti and Future Humanitarian Disasters", Up-Front Blog, Brookings Institution, 12 January 2011, http://www.brookings.edu/opinions/2011/0112_haiti_ferris.aspx

During and after a natural disaster, the displaced often seek temporary shelter with friends or family or in shelters or camps set up by the government or international organizations. The examples of Haiti and Pakistan illustrate the diversity of experiences. In Haiti, people affected by the earthquake were encouraged to leave Port-au-Prince to seek shelter with relatives and friends living in smaller towns and rural areas. More than half a million did so, raising the possibility that the movement could reverse the centralization of the nation's population and resources in Port-au-Prince. But the strain on host communities has been substantial and there are reports of displaced Haitians returning to Port-au-Prince, either because the assistance in the provinces is inadequate, because their damaged homes have been assessed as safe, or because they perceive that there are more opportunities in the capital.[115] However, in addition to the more than 500,000 individuals who left Port-au-Prince, some 1.3 million were displaced within the city. One year after the quake, the number of people living in IDP camps was estimated to be around 810,000.[116] With many camps located on private land, and no alternative housing solutions for the displaced population in sight, instances of forced evictions have been rising. Some landowners have begun using threats and violence by gangs to force IDPs to leave the land they have been temporarily occupying.[117] In Pakistan, initially there were reportedly 6 million people in need of shelter. By September, 1.8 million persons were reportedly sheltered in IDP camps, with that number declining to slightly over 124,000 in January 2011.[118]

The displacement of Pakistanis by the floods needs to be understood in the context of broader patterns of Pakistani displacement caused by conflict over territorial control and human rights abuses. At the time of the floods in late July 2010, there were around two million conflict-induced IDPs in Pakistan's north-western Federally Administered Tribal Areas (FATA) and Khyber-Pakhtunkhwa (KP)—also the worst flood-affected areas.[119] Only 1.25 million of the roughly 3 million displaced by military counterinsurgency campaigns in 2009 had returned by November 2009. The overwhelming majority (90 percent) of those displaced in 2009 sought refuge with host communities or rented accommodation, putting an enormous strain on families and public services before the floods. Once the floods occurred in July 2010, these host families bore the double burden of being both hosts

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115 The New York Times, "Rural Haiti Struggles to Absorb Displaced", 16 March 2010, http://www.nytimes.com/2010/03/17/world/americas/17rural.html

116 IOM, "Displacement Tracking Matrix: Summary of IDPs Situation", 20 January 2011, http://www.cccmhaiti.info/pdf/dtm_summary_idps_january_2011.pdf

117 Representative of the Secretary-General on the Human Rights of Internally Displaced Persons, Mr. Walter Kälin, *Human Rights of Internally Displaced Persons in Haiti: Memorandum based on a Working Visit to Port-au-Prince (12–16 October 2010*), November 2010, http://ijdh.org/wordpress/wp-content/uploads/2010/11/Kalin-Statement-2010-Haiti-English.pdf, p. 5

118 OCHA, "Pakistan Monsoon Floods, Situation Report # 23, 9 September 2010", see also: OCHA, "Pakistan Humanitarian Bulletin # 13", 12–20 January 2011

119 Due to under-registration only 1.4 million of them were registered by the government. See Internal Displacement Monitoring Centre (IDMC), *Millions of IDPs and returnees face continuing crisis—A profile of the internal displacement situation,* 2 December 2009, available at: http://www.internal-displacement.org. See also: Asian Development Bank and World Bank, *Pakistan North West Frontier Province and Federally Administered Tribal Areas: Preliminary Damage and Needs Assessment: Immediate Restoration and Medium Term Reconstruction in Crisis Affected Areas*, prepared for the Government of Pakistan, November 2009, http://www.adb.org/Documents/Reports/PAK-FATA-Damage-Needs-Assesment-Nov-2009.pdf

and flood-affected, with aid agencies reporting as early as August that many of them required assistance.[120] In both the conflict- and disaster-induced displacement in Pakistan, a particular challenge was the fact that many thousands of displaced Pakistanis took shelter in schools, depriving local communities of educational facilities. OCHA reported in October that many district authorities in the flood areas were pushing people to leave schools. In some cases, alternative camps were established for IDPs who had to leave schools.[121]

As the cases of Pakistan and Haiti have shown, a major challenge in displacement situations is to prevent them from becoming protracted. While there is at least some literature on protracted displacement as a result of conflict, there is very little substantial academic research on the long-term displacement resulting from disasters.[122] The assumption is that people return home quickly—and this is probably true for many—but in some cases their former places of residence are no longer habitable (as when mudslides obliterate a town), or their source of livelihood has been destroyed. There is at least anecdotal evidence that thousands of people displaced by Hurricane Mitch in 1998 and strong evidence that thousands displaced by Hurricane Katrina were never able to return to their communities (also see Chapter 4 of this report). In some, perhaps most cases, they have found other durable solutions, but we simply do not know.

POLITICAL DIMENSIONS OF DISASTER RELIEF

It is the responsibility of national authorities to take actions to mitigate the effects of natural hazards and to respond to the needs of their people when disasters do occur. But large-scale natural hazards overwhelm the capacity of even wealthy, developed countries as evident in the US response to Hurricane Katrina five years ago. In Haiti and Pakistan, international assistance was needed to supplement the efforts of the national government. In both countries, the initial responses of the

120 See: USAID, Pakistan, "Disaster Assistance at a Glance", 8 February 2011, http://www.usaid.gov/our_work/humanitarian_assistance/disaster_assistance/countries/pakistan/template/ See also: IDMC, *PAKISTAN, Flooding worsens situation for people displaced by conflict in north-west,* 6 September 2010

121 OCHA, "Pakistan Humanitarian Bulletin 3", 21 October 2010, http://reliefweb.int/rw/RWFiles2010.nsf/FilesByRWDocUnidFilename/VVOS-8AFLFR-full_report.pdf/$File/full_report.pdf

122 Alex Mundt and Elizabeth Ferris, "Durable Solutions for IDPs in Protracted Situations: Three Case Studies," Brookings-Bern Project on Internal Displacement, October 2008, http://www.brookings.edu/papers/2008/1028_internal_displacement_mundt.aspx; UNHCR, "Conclusion on Protracted Refugee Situations," Executive Committee Conclusions, No. 109 (LXI) – 2009, 22 December 2009, http://www.unhcr.org/4b332bca9.html. *Forced Migration Review – Protracted Displacement*, Issue 33, September 2009, available at: http://wwww.reliefweb.int/rw/lib.nsf/db900sid/VVOS-7VKSA3?OpenDocument&query=protracted%20displacement; IDMC, *Protracted Internal Displacement in Europe: Current Trends and Ways Forward*, May 2009, available at: http://www.internal-displacement.org; "Protracted refugee situations: some frequently asked questions", Evaluation and Policy Analysis Unit, UNHCR, Geneva, 2002, available at http://www.unhcr.org/pages/4a1d28526.html; Walter Kälin (Representative of the UN Secretary-General on the Human Rights of Internally Displaced Persons), "Protracted Displacement in Europe," Speech delivered at Council of Europe Parliamentary Assembly Debate on Protracted Displacement in Europe, June 2009, http://www.brookings.edu/speeches/2009/0624_europe_kalin.aspx

national governments were not inspiring. Haitian President André Préval seemed dazed and withdrawn while Pakistani President Asif Zadari continued his travels in Europe. In both countries—as in most large-scale disasters such as Hurricane Katrina—affected communities are often angry at the government for the slowness of its response. Displacement can make it more difficult for communities to protest. For example, it was harder for the victims of Hurricane Katrina to mobilize once they were dispersed throughout the country. But in several cases protests against a government's slow or inadequate response to a disaster come on top of sustained dissatisfaction with governmental performance. Rarely are such protests the determining factor in violent efforts to overthrow a government, but they can exacerbate existing tensions. It was the poor response by Anastasio Somoza to the 1976 earthquake in Nicaragua which seemed to be the final straw that led to his overthrow and the ushering in of the Sandinista regime. In 1970, Cyclone Bhola ravaged what was then East Pakistan, causing at least 300,000 (and perhaps as many as 500,000) deaths. Protests against the government of West Pakistan had been intensifying for a year, but it was the callous response of the West Pakistani government to the relief efforts which proved to be the final trigger. Within a year of the cyclone, East Pakistan had become the new country of Bangladesh.

Haiti, as many commentators have noted, has a long history of poverty, corruption, and poor governance. The earthquake occurred near the capital city, which meant that government was almost completely paralyzed in the days immediately following the disaster; 26,000 civil servants are estimated to have perished, government ministries and agency headquarters were destroyed, there were major communications difficulties, and the sheer trauma of so many government workers losing family and homes meant that they were not able to carry out their responsibilities. Haiti has no military and its police forces, as well as the UN peacekeeping forces (MINUSTAH)—which also suffered significantly due to the quake—were overwhelmed.

The Haitian earthquake wreaked havoc not only with the country's infrastructure, but also with the governance of the country. The earthquake occurred at a time when the political situation was already volatile. 2010 was an election year marked by fierce competition among over one hundred political parties and by widespread protests. The earthquake led to uncertainty about when legislative and presidential elections would be held. As its term came to an end (and at that time with no election date in sight) the Haitian parliament was dissolved in mid-May.[123] Only five months after the disaster the legislative and presidential elections were rescheduled for November 28. Being able to register and vote was not the most immediate or highest priority for either the affected communities or the relief community, but the fact that 15–20 percent of the population was displaced and many voting registries were destroyed meant that restoring the political infrastructure of the country will be a long-term process. The November elections also had other consequences for earthquake recovery efforts because the fact that political leaders and government ministers were absorbed with the highly competitive electoral process meant that many were unavailable to make decisions needed

[123] International Crisis Group, *Haiti: Stabilisation and Reconstruction after the Quake*, Latin America/Caribbean Report No. 32, 31 March 2010, p. 1

for the recovery effort. Relief workers reported that it was difficult to negotiate with governmental authorities when it was commonly understood that those authorities would likely not be present after a new government was installed.[124]

The November 2010 elections were marked by widespread irregularities, confusion, and controversy over the results. Following the announcement of the results of the presidential election—a run-off between two candidates—there were protests and riots in Port-au-Prince. The Organization of American States (OAS) was called in to review the process and results and ended up recommending that in light of electoral irregularities, one of those two candidates (Jude Célestin, the candidate of Haitian president André Préval) would not qualify to take part in the runoff election. It was not until January 2011 that the government accepted the recommendation of the OAS and that Jude Célestin withdrew his candidacy.[125] However the fact that the second round of elections will not be held until March 2011 means that for a period of at least six months, the energies of Haiti's political leadership was focused on disputing the legitimacy of the elections rather than on applying effective leadership to the recovery effort.

Like Haiti, Pakistan has a history of turbulent governance and ranks high on indices of corruption (see Table 1 above). But it has a strong civil service and a strong military with experience and a history of responding to national disasters. In the case of the 2005 earthquake, the Pakistani army played the leading role in immediate disaster response, and local governments and institutions generally performed well. There was also an impressive response from Pakistani civil society and the business sector. The Pakistani government immediately set up the Federal Relief Commission to oversee and coordinate all aspects of emergency response (with military and civilian wings).[126] The many international agencies that responded to the Pakistani earthquake worked under the direction of the Pakistani Federal Relief Commission, and often under the military. Civil-military relations were generally good and the US military performed important supportive missions in the relief effort. While the assessment of the government's response was initially positive, reports over the ensuing months have painted a less rosy picture, with stories of widespread corruption and diversion of funds intended for long-term reconstruction of earthquake-devastated areas.[127]

Unlike Haiti, where President Aristide disbanded the army in 1995, Pakistan's armed forces still represent an important state institution. In the summer of 2010 the Pakistani military was involved in a large-scale offensive in the north of the country—areas also affected by the flooding. As noted

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124 Interviews with relief workers by Elizabeth Ferris, January 2011

125 Guardian, "Haiti Amends Results of November Elections to Oust Celestin", 2 February 2011, http://www.guardian.co.uk/world/2011/feb/03/haiti-elections-celestin

126 For a Pakistani military perspective on this, see Major-General Farooq Ahmad Khan, "The Response to the Earthquake in Pakistan", *Federal Relief Commissioner Humanitarian Exchange Magazine*, Issue 34, July 2006, http://www.odihpn.org/report.asp?id=2811

127 Dean Nelson, "£300m Earthquake Aid 'Misused by Zardari'", The Daily Telegraph, 13 August 2010, http://www.telegraph.co.uk/news/worldnews/asia/pakistan/7944792/300m-earthquake-aid-misused-by-Zardari.html, see also: Economist, "After the Deluge", 19 August 2010, http://www.economist.com/node/16846266?story_id=16846266

above, some 3 million people were displaced in 2009; while most had returned to their communities, the flooding displaced many for a second time within the course of a year. In fact, some camps housing people displaced by violence had to be evacuated due to flooding.[128] And for those affected but not displaced by the military operations, the flooding set back efforts to rebuild their communities—communities which suffered major damage as a result of Taliban activity and the counter-insurgency campaigns. Thus, in Pakistan, response to the floods has had an overtly military component which has not characterized the response to the earthquake in Haiti.

THE POLITICS OF RELIEF

When a major disaster occurs, the international humanitarian system swings into action. The UN issues an appeal—typically a flash appeal issued quickly, followed by a comprehensive appeal as soon as more information is available—donors pledge money, and a host of international governmental and non-governmental organizations get into gear. In the case of Haiti, the flash appeal was issued on 15 January—3 days after the earthquake. In the case of Pakistan it was launched on 11 August—12 days after the first OCHA situation report, illustrating the difficulty of responding to relatively slow-onset disasters. In the case of Pakistan it is difficult to know when the disaster even began. On 29 July, it was difficult to know whether this was going to be a really torrential monsoon provoking a large-scale disaster or just rains that were heavier than usual and which would soon clear up. Reports emerging only in February 2011 indicated that in fact the Pakistani Meteorological Department realized in July that "massive, unprecedented rainfall" could be expected in northwest Pakistan, but the data was neither analyzed nor shared with national Pakistani authorities in a timely fashion.[129] Christine Fair, an academic and expert on Pakistan reported that Meteorological Department officials had a difficult time getting the message out about the impending floods because on the same day they were putting out warnings, one of the worst aviation disasters in Pakistani history occurred. The media was focused on this disaster rather than reporting on the rains and the devastating floods that resulted.[130]

Much has been made of the fact that the international community was much slower to respond to the Pakistani floods than to the Haitian earthquake.[131] After two weeks of the flash appeal, 82 percent of Haiti's appeal had been funded, compared with only 57 percent in the case of Pakistan.

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128 International Displacement Monitoring Center, "Pakistan: Conflict IDPs Among Millions Displaced by Flooding", IDP News Alert, 13 August 2010, http://www.internal-displacement.org/8025708F004D31AA/(httpIDPNewsAlerts)/6241ABFD35A2D500C125777E00333CE7?OpenDocument

129 Washington Post, "Pakistan floods hold lesson on deadly information gap", 14 February 2011, p. A5., http://www.washingtonpost.com/wp-dyn/content/article/2011/02/13/AR2011021302479.html

130 Christine Fair, Presentation at "Pakistan Six Months After the Floods", an event organized by the Atlantic Council, Washington DC, 15 February 2011, http://acus.org/event/pakistan-six-months-after-floods

131 See: Oxfam, Pakistan Floods: Rebuilding Impossible without Adequate Funds, 16 August 2010, http://www.oxfam.ca/node/2304, see also: UNICEF, UNICEF's Pakistan disaster relief operations in jeopardy due to funding shortage, 17 August 2010, http://www.unicefusa.org/news/releases/unicefs-pakistan-disaster.html

But the differences were even greater when contributions are considered with respect to the total number of affected people. Contributions per affected person were $157.16 for Haiti two weeks after the appeal, and only $15.24 per affected Pakistani—a ten-fold difference. Brookings Institution researchers Rebecca Winthrop and Justin van Fleet attribute at least some of this disparity to differences in major global English-language media coverage, finding in the case of Haiti well over 3,000 stories in print and broadcast media within 10 days of the earthquake while Pakistan registered only slightly more than 1,000.[132]

While a few governments, notably the US, made rapid contributions to Pakistan flood relief, other governments took longer to respond. While Saudi Arabia, after a certain delay, became one of the most generous donors,[133] and Turkey, the United Arab Emirates and Kuwait are among the top 25 donor countries to Pakistan,[134] other Muslim countries contributed little to disaster relief operations in Pakistan. But the most striking difference has been that in contributions from individuals. For example, one source reports that while $31 million were raised by the American Red Cross in Haitian earthquake relief in the US via text-messaging, only $10,000 was raised through this medium for victims of Pakistan's floods.[135]

However, the record is less clear when it comes to how this money translates into humanitarian operations on the ground. In particular, tents and plastic sheeting—the most basic types of shelter—were delivered much more rapidly in Pakistan than in Haiti. After three weeks, Haitians had received only upwards of 10,500 tents versus more than ten times this amount for Pakistan: 109,500. Even controlling for disparity in the numbers affected, the differences are significant: 1.2 percent of Haitians in need of shelter had received tents after 3 weeks, compared to 3 percent of Pakistanis in the same time period. It should be noted, however, that in both cases the percentages are very low, particularly in light of the fact that large numbers of traumatized people lacked the most basic protection from the elements.

By the end of 2010, while there were still disparities between both overall funding raised for Haiti and for Pakistan and in funding per affected person, Haiti had received $3.5 billion in funding and Pakistan $2.2 billion, with the UN emergency appeal funding for both disasters standing equally at $1.1 billion (see Table 1). Given that the floods in Pakistan started in the middle of the year in com-

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132 Winthrop, Brookings Institution, "An Estimated 20 Million Pakistanis in Desperate Need: Why So Little Media Attention?", http://www.brookings.edu/opinions/2010/0818_pakistan_flood_winthrop.aspx

133 OCHA, Financial Tracking Service, "PAKISTAN – Flood – July", 25 August 2010, http://fts.unocha.org/reports/daily/ocha_R24_E15913___1008251843.pdf

134 OCHA, Financial Tracking Service, "PAKISTAN - Flood – July", 18 January 2011, http://fts.unocha.org/reports/daily/ocha_R24_E15913___1102181521.pdf

135 The Atlantic, "4 Reasons Why Americans Aren't Giving for Pakistan Flood Relief", 23 August 2010, http://www.theatlantic.com/international/archive/2010/08/4-reasons-why-americans-arent-giving-for-pakistan-flood-relief/61898/; See also: Foreign Policy, "Why Doesn't the World Care About Pakistanis?", 19 August 2010, http://www.foreignpolicy.com/articles/2010/08/19/why_doesnt_the_world_care_about_pakistanis

parison with Haiti's earthquake January, funding levels for both disasters do not appear as unequal as in the early stages of the disaster response.

Why were contributions, particularly in the initial phases, so much slower to be made in the case of Pakistan than for Haiti? A number of commentators have given various reasons for this, including the perceptions in donor countries of Pakistan as a corrupt country that harbors terrorists, the nature of the disaster whereby rising flood waters do not trigger the same sense of urgency as an earthquake that demolishes buildings and kills hundreds of thousands in a few seconds. In the case of Haiti, proximity to the US meant that many civic groups could simply collect relief items and travel to Haiti on their own. Moreover, the presence of a large number of Haitians and Haitian-Americans living in the US generated considerable interest in responding while the corresponding number of Pakistanis living in the US is much lower. The relatively low number of deaths in Pakistan compared with Haiti was undoubtedly a factor, but also the nature of the injuries suffered. Media coverage of the truly horrific injuries in Haiti—which are a characteristic of earthquakes—was widespread. In contrast, the major health threat affecting children in Pakistan at present are gastrointestinal diseases (diarrhea, cholera) and skin diseases—which do not trigger the same response as a child facing the loss of a limb or who has been crushed by falling debris.

Some have suggested that the differential response was the result of donor fatigue—coming so soon after Haiti, people were reluctant to contribute to Haiti.[136] But response to the 2005 Pakistan earthquake was generous[137] (although the response was slow in comparison with the rapid response to Haiti)—and it occurred 10 months after the 2004 Indian Ocean tsunami.

It is important to look not only at pledges of funds, but also at how quickly they are converted into cash contributions. At donors' conferences or through the media, donor governments take pride in announcing large pledges—particularly in cases of high-visibility emergencies. Yet the reality is quite different with respect to the funds transferred as demonstrated in the table below on a few major disasters.

REDUCING THE RISKS OF DISASTERS

Finally, the experiences in both Haiti and Pakistan highlight the importance of taking measures to mitigate the effects of natural disasters. Earthquakes and monsoons cannot be prevented by human action, but actions can be taken which will decrease their risk to populations. The importance of Disaster Risk Reduction (DRR) has long been recognized as an important hallmark of good development planning. Public statements after a major disaster always include a commitment to

[136] Reuters, "U.N. Battles Donor Fatigue for Funds for Pakistan", 17 August 2010, http://www.reuters.com/article/2010/08/17/us-pakistan-floods-idUSTRE66T3RS20100817

[137] OCHA, Financial Tracking Service, "SOUTH ASIA - Earthquake - October 2005, Table B: Total Humanitarian Assistance per Donor (Appeal plus other*)", UN OCHA, 24 February 2011

TABLE 2 Disparity Between Pledging and Delivery of Aid After Disasters[138]

Crisis	Amount pledged ($)	Amount delivered ($)
Cambodian war rehabilitation[139]	880 m by June 1992	460 m by 1995
Rwandan genocide[140]	707 m in January 1995	<71 m by July 1995
Hurricane Mitch, Central America[141]	9 bn in 1998	<4.5 bn, December 2004
Bam earthquake, Iran*	1 bn in January 2004	116 m December 2004
Haiti earthquake[142] **	508 m in August 2010	134.2 m August 2010

* Data from E. Mansilla, Universidad Nacional Autónoma de México.
**This amount includes all pledges made to the Haiti Reconstruction Fund which is administered by the World Bank. Donors at the Haiti Donor's conference on the 31st of March 2010 pledged $5.3 billion for reconstruction for the first two years, most of which should be channeled through the Haiti Reconstruction Fund.

incorporate DRR in the reconstruction process. But it is harder to generate both political and donor support for long-term mitigation measures than for immediate response to disaster victims. But the evidence is clear that DRR saves lives. For example, during the 2001 Bhuj earthquake in India, most government buildings that conformed to construction codes suffered only limited damage, while schools and hospitals that did not follow the codes collapsed.[143] When Cyclone Sidr struck in November 2007, an estimated 3.2 million Bangladeshis were evacuated from the coastal areas and over two million were already in special shelters when the cyclone hit. About 4,000 Bangladeshis died—compared with around 140,000 in a similar cyclone in 1991 and up to 500,000 in 1970.[144]

It will be interesting to follow the reconstruction processes over the next few years to assess the extent to which the risk of future disasters has been reduced. Despite noble and probably well-meaning rhetoric, past experiences do not inspire confidence.

FINAL POINTS

The process of delivering relief aid itself is often seen as a political action. People affected by disasters rely on their governments more than ever during and after these devastating events. When

138 Peter Walker et al., *Smoke and Mirrors: Deficiencies in Disaster Funding*, Feinstein International Famine Center, Friedman School of Nutrition Science and Policy, Tufts University, January 2005, p. 248
139 Stewart Patrick. *The Check Is in the Mail: Improving the Delivery and Coordination of Post-Conflict Assistance.* New York: Center on International Cooperation, 1998. www.nyu.edu/pages/cic/pubs/TheCheck.html
140 Ibid
141 BBC News, "Delivering the Promise: Aid Problems", 6 Jan 2005, http://news.bbc.co.uk/2/hi/asia-pacific/4152285.stm
142 Haiti Reconstruction Fund, "Pledging Donors", 24 August 2010, www.haitireconstructionfund.org/hrf/members
143 Economic and Political Weekly, "Reducing Earthquake Loss: Towards a National Perspective"April 20, 2002. in: OXFAM, *Rethinking Disasters, Why Death and Destruction Is Not Nature's Fault but Human Failure*, 2008
144 Oxfam International, *Rethinking Disasters*, 2008, http://www.oxfam.org.uk/resources/policy/conflict_disasters/downloads/oxfam_india_rethinking_disasters.pdf, p. ii

people affected by a disaster view their government to be responding rapidly and compassionately, its legitimacy increases. Reports are that the Pakistani military took the leadership role in the 2010 relief effort. The military possesses capacities and logistical expertise that no one else has when disasters of this magnitude occur. In response to the earthquake in Haiti, the US military was in the lead and mobilized massive amounts of assets (see Table 1), but its role in Pakistan, while still important, was on a much smaller scale. Instead it was the Pakistani military which deployed 60,000 or so troops in support of the relief operations.

There was some concern in Pakistan that militant groups were moving into the vacuum created by the floods and gain legitimacy through engaging in relief efforts, but these turned out to be isolated reports of initiatives taken in local communities. Unlike the situation of Hezbollah in Lebanon, insurgent groups have not developed long-term social service programs which they can use for service delivery. Nor is it thought that Pakistani militants presently have the funds necessary to support large-scale relief programs. But the possibility of non-state actors taking advantage of popular frustration with the relief effort is a further compelling reason to support the government's timely and effective response.

Other disasters have proven that while a quick governmental response to the victims is important, how the relief is distributed is just as important. When relief items are distributed inequitably—or even more importantly, when they are *perceived* as being distributed inequitably—resentment develops. For example, after the 2004 tsunami, the perception that Tamils were being discriminated against in Sri Lankan relief operations contributed to an increase in tensions—and violence.[145]

Response to the two disasters also illustrates the weaknesses of the international humanitarian system. This is not a command-and-control system, but rather one where negotiation, political interests, and downright cajoling are necessary to get the required resources mobilized and delivered. Slow delivery of relief in Haiti and Pakistan was partly the result of the nature and scale of the destruction, but may also indicate that our global response system is unable to respond to two mega-disasters occurring within a few months of each other.

Within the UN system, there is no centralized standing force of disaster responders although there are staff in many individual organizations who are standing by to respond quickly. The UN's Emergency Relief Coordinator, the most senior figure in the international humanitarian system, can actually deploy only OCHA personnel; other UN agencies, governments, and NGOs decide on the deployment of their own staff. While the UN tries to effectively coordinate actions, such coordination is almost inevitably flawed given the fact that each actor is responding on the basis of its own mandate, constituency and funding.

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[145] Elizabeth Ferris, *Natural Disasters, Conflict, and Human Rights: Tracing the Connections,* presented at St. Mary's University, San Antonio Texas, 3 March 2010, http://www.brookings.edu/~/media/Files/rc/speeches/2010/0303_natural_disasters_ferris/0303_natural_disasters_ferris.pdf

While most comparisons of the international response to the Haitian earthquake and the Pakistani floods have focused on levels of funding and the immediate response period, perhaps the most striking differences are in the later periods. While three times as many camps or sites for IDPs were initially set up in Pakistan (4,788 as of October 2010) as in Haiti (1,555 in July 2010), accommodating more IDPs (1.8 million in Pakistan, compared with 1.5 million in Haiti), the process of finding solutions for Haiti's displaced has proceeded much more slowly. By the end of the year, the number of Haitians living in IDP camps and settlements had fallen by about a third (from 1.5 to 1.0 million) while in Pakistan, less than 10 percent of the displaced (124,000) remained in camps/sites by year-end.[146] This is likely the result of stronger Pakistani government leadership in recovery efforts as well as more robust socio-economic conditions in Pakistan in comparison with Haiti. But it also suggests that comparison of disaster response needs to take a longer perspective and to focus much more on the recovery phase of the response. As has often been noted, media attention to natural disasters is usually short-lived while affected communities, national policy-makers and the international humanitarian agencies are left with the often daunting task of recovery and reconstruction.

[146] Statistics from Table 1 above

Photo: © iStockphoto

Eruption of Eyjafjallajökull volcano in Iceland.

CHAPTER 3:
VOLCANO DISASTERS IN 2010

THE CHALLENGES OF EVACUATIONS AND "THE YEAR OF GROUNDED PLANES"

"(…) Volcanoes in all their violence of destruction, hurricanes leaving desolation in their track, the boundless ocean rising with rebellious force, the high waterfall of some mighty river, and the like, make our power of resistance of trifling moment in comparison with their might. But, provided our own position is secure, their aspect is all the more attractive for its fearfulness; and we readily call these objects sublime, because they raise the forces of the soul above the height of vulgar commonplace, and discover within us a power of resistance of quite another kind, which gives us courage to be able to measure ourselves against the seeming omnipotence of nature."[147]

—Immanuel Kant

Eighteenth-century German philosopher Immanuel Kant's theory of the sublime attempts to explain the awe experienced when watching a volcano erupt. This theory is also useful in explaining why volcano eruptions generate so much media attention. In 2010 two such eruptions captured most of the attention, the eruption of Eyjafjallajökull volcano in Iceland, which resulted in the largest air traffic shut-down since World War II, and the eruption of Mount Merapi in Indonesia, which caused more than 300 casualties, displaced more than 300,000 people and forced U.S. President Barack Obama cut short his state visit to Indonesia.

This short article focuses on the lessons to be learned from these two volcanic eruptions in 2010. After analyzing volcano statistics for the year, the broader issue of evacuations in natural disasters is examined by looking at the eruption of Mount Merapi. The effects of volcanic eruptions on air travel is then discussed in light of the fact that 2010 was the year with the most flight interruptions caused by volcanic ash in human history.

An average year?

Statistically, 2010 was not an extraordinary year for volcanic disasters. The International Disaster Database EM-DAT recorded six volcanic disasters: two in Indonesia and one each in Ecuador, Guatemala, Iceland, and the Philippines.[148] The number of individuals affected by volcanoes was slightly

147 Immanuel Kant, *The Critique of Pure Judgment*, 1790, translated by James Creed Meredith, http://philosophy.eserver.org/kant/critique-of-judgment.txt

148 If not indicated otherwise all subsequent statistics are from following source: EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

Glossary of Volcano and Related Terminology*

Ejecta: Material that is thrown out by a volcano, including pyroclastic material (tephra) and, from some volcanoes, lava bombs;

Magma: Magma is molten or partially molten rock beneath the Earth's surface. When magma erupts onto the surface, it is called lava;

Lava: Lava is the word for magma (molten rock) when it erupts onto the Earth's surface. Geologists also use the word to describe the solidified deposits of lava flows and fragments hurled into the air by explosive eruptions (for example, lava bombs or blocks);

Tephra: Tephra is a general term for fragments of volcanic rock and lava regardless of size that are blasted into the air by explosion or carried upward by hot gases in eruption columns or lava fountains;

Pumice: Pumice is a light, porous volcanic rock that forms during explosive eruptions;

Pyroclastic Flow: A pyroclastic flow is a ground-hugging avalanche of hot ash, pumice, rock fragments, and volcanic gas that rushes down the side of the volcano as fast as 100 km/hour or more. The temperature within a pyroclastic flow may be greater than 500° Celsius (932° Fahrenheit), sufficient to burn and carbonize wood;

**Source*: U.S. Geological Survey

higher than the 2000–2009 average, with 170,361 affected in 2010 and 145,107 affected on average in each of the previous 10 years.

TABLE 1 Volcano Casualties in 2010[149]

Volcano	Country	Killed	Affected
Merapi	Indonesia	322	137,140[150]
Sinabung	Indonesia	1	15,060
Bulusan	Philippines		14,161
Tungurahua	Ecuador		2,500
Pacaya	Guatemala		1,500
Eyjafjallajökull	Iceland		
Total		323	170,361

[149] EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

[150] Media report more than 320,000 internally displaced persons because of the Mt. Merapi eruption, see: Republika Online, "Terjunkan 380 Relawan, BNPB Data Ulang Pengungsi Merapi", 9 November 2010, http://www.republika.co.id/berita/breaking-news/nusantara/10/11/09/145672-terjunkan-380-relawan-bnpb-data-ulang-pengungsi-merapi

As with the earthquake in Haiti, which was responsible for over 90 percent of worldwide disaster fatalities, one eruption was responsible for more than 99 percent of fatalities from volcanoes: Mount Merapi on Java Island, Indonesia. This disaster, which took place in one of the most densely populated parts of the world, killed 322 people, mostly through pyroclastic flows and also pushed the casualty numbers for volcano victims to more than ten times the average of 24 volcano casualties per year in the 2000–2009 period. In fact, all recorded fatalities from volcanic eruption in 2010 occurred in Indonesia.

The eruption of Merapi was also the deadliest of any volcano within the last decade (see Table 2) and the deadliest eruption since Mt. Pinatubo on the Philippines in 1991 (see Table 3). In terms of number of people affected, it ranked third,[151] behind only the eruptions of Tungurahua in Ecuador in 2006 and Karthala in Comoros in 2005.

TABLE 2 Top 5 Volcano Disasters 2000–2010 by Numbers Killed[152]

Volcano	Country	Year	Deaths	Affected
Mt. Merapi	Indonesia	2010	322	137,140
Mt. Nyiragongo	Congo Dem Rep.	2002	200	110,400
Nevado del Hila	Colombia	2008	16	8,007
Jabal al-Tair	Yemen	2007	6	15
Mount Arteale	Ethiopia	2007	5	2,000
Tungurahua	Ecuador	2006	5	300,013

TABLE 3 Top 5 Volcano Disasters 1980–2010 by Numbers Killed[153]

Volcano	Country	Year	Deaths	Affected
Nevado Del Ruiz	Colombia	1985	21,800	12,700
Lake Nyos	Cameroon	1986	1,746	10,437
Mt. Pinatubo	Philippines	1991	640	1,036,065
Mt. Merapi	Indonesia	2010	322	137,140
Mt. Nyiragongo	Congo Dem Rep.	2002	200	110,400

[151] The numbers used by EM-DAT are very conservative. As noted in the subchapter about the Merapi eruptions the Indonesian government stipulated that at least 160,000 people were housed in government shelter at the height of the disaster. As many evacuees stayed with host-families or left the area, the total number of displaced was certainly higher than 160,000 persons. Some media reports speak of up to 320,000 IDPs caused by Merapi

[152] EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

[153] EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

TABLE 4 Top 5 Volcano Disasters 2000–2010 by Numbers Affected[154]

Volcano	Country	Year	Deaths	Affected
Tungurahua	Ecuador	2006	5	300,013
Karthala	Comoros	2005	1	245,000
Mt. Merapi	Indonesia	2010	322	137,140
Reventador	Ecuador	2002	0	128,150
Mt. Nyiragongo	Congo Dem Rep.	2002	200	110,400

Volcano eruptions are measured via the VEI (Volcano Explosivity Index) number,[155] which measures the volume of ejecta (magma, tephra) and the height of the eruption column. The biggest eruption in 2010 was that of Eyjafjallajökull in Iceland, which released approximately 250 million m^3 of ejecta,[156] compared to the 140 million m^3 of ejecta[157] released in the Merapi eruption. As both volcanoes released more than 0.1 and less than 1.0 km^3 of ejecta both of them are ranked VEI 4 on the 8 level VEI scale (see Table 5 below).

TABLE 5 Volcano Eruptions According to VEI Scale[158]

VEI #	Tephra volume (km^3)	Volcano	Country	Year
VEI 3	>0.01	Etna	Italy	2002–2003
VEI 4	>0.1	Merapi Eyjafjallajökull	Indonesia Iceland	2010 2010
VEI 5	>1	Mount St. Helens	USA	1980
VEI 6	>10	Krakatau Pinatubo	Indonesia Philippines	1883 1991
VEI 7	>100	Tambora	Indonesia	1815

154 EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

155 San Diego State University, Department of Geological Studies, "How Volcanoes work, Eruption Variability", 31 March 2006, http://www.geology.sdsu.edu/how_volcanoes_work/Variability.html

156 Independent, "Iceland volcano has spewed 250 million cubic metres of ash", 18 May 2010, http://www.independent.co.uk/environment/iceland-volcano-has-spewed-250-million-cubic-metres-of-ash-1975747.html

157 CNN, "Indonesia Mount Merapi Volcano Erupts Again Friday", 12 November 2010, http://articles.cnn.com/2010-11-12/world/indonesia.volcano_1_major-eruption-volcano-volcanic-material?_s=PM:WORLD

158 Smithsonian Museum of Natural History, Global Volcanism Program, "Eruption Data Criteria", http://www.volcano.si.edu/world/eruptioncriteria.cfm#VEI

SECTION 1: EVACUATIONS – CHALLENGES AND HUMAN RIGHTS GUIDELINES

The case of Mount Merapi demonstrates the delicate balance that authorities have to manage when deciding when and how to evacuate people to protect them from the hazards posed by volcanoes. Because of the fertile volcanic soil, many volcanic slopes are densely populated. In many cases, as demonstrated in the case of Mount Merapi—which erupts frequently and had erupted only four years earlier—people are accustomed to living with the dangers posed by volcanoes. Often people can only be convinced to leave their houses, fields and livestock when eruptions are imminent or already underway. Fearing the loss of their property, possessions, and livestock if they flee, they discount the dangers posed by eruptions.

By looking at the way events unfolded around Mount Merapi in October and November 2010, and particularly at the Government of Indonesia's evacuation policies, we hope to illustrate some of the challenges authorities everywhere face in making decisions to evacuate people facing natural hazards and how such evacuations can be carried out in accordance with human rights standards.

THE 2010 MOUNT MERAPI ERUPTIONS

Seismic and volcanic activities had been increasing since mid-September and on 25 October the Indonesian government raised the alert status for Mount Merapi to its highest level (level 4) and urged the estimated 40,000 inhabitants living within a 10 km radius of the crater to evacuate. Pyroclastic flows that caused the most damage during previous eruptions in 2006 and 1996 had not surpassed that radius. The previous eruptions had also led to the creation of evacuation shelters on the periphery of the 10 km evacuation radius. This is where most of the evacuees took refuge in late October.

Evacuation efforts were still in progress when the first major eruption occurred on 26 October. 15,000 local residents had still not left the danger zone, many of whom were reluctant to leave behind their livestock and possessions.[159] This first major eruption caused at least 28 fatalities, among them the highly revered spiritual gatekeeper of the volcano, who had urged people to follow the government's orders, but who himself declined evacuation on grounds that it was his duty not to leave the mountain.[160] The massive power of the 26 October eruptions and the resulting fatalities convinced more people living in the danger area to evacuate. Reports on 1 November indicated that nearly 70,000 had been evacuated, with about 40,000 people staying at the emergency shelters.[161]

[159] Jakarta Post, "Indonesia's Mount Merapi Volcano Erupts", 25 October 2010, http://www.thejakartaglobe.com/home/indonesias-mount-merapi-volcano-erupts-again-witnesses/404042

[160] Reuters – AlertNet, "Indonesia's Twin Disasters Kill More than 300", 27 Oct 2010, http://www.reliefweb.int/rw/rwb.nsf/db900sid/JDUN-8AM85E?OpenDocument&rc=3&emid=VO-2010-000214-IDN

[161] Reuters – AlertNet, "Indonesia Volcano Erupts Again, Tsunami Deaths Hit 430", 1 November 2010, http://www.reliefweb.int/rw/rwb.nsf/db900sid/MCOI-8ASHBZ?OpenDocument

Still, even while eruptions were ongoing, many people would return to their villages on a daily basis to feed their livestock and to check on their possessions.

After a couple of quieter days, on 1 November, a massive eruption sent a huge pyroclastic flow of ash and hot gases down the volcano's slopes. Residents who had grown accustomed to witnessing the volcano release searing gas and clouds of ash over the past eight days jumped on motorcycles and fled for their lives as evidence mounted that the 2010 eruptions would be more massive than any other in the living memory of inhabitants in the area. Hundreds fled from emergency shelters located 10 km from the peak that day to areas that were further away from the volcano.[162] After this incident and another even bigger eruption on 3 November, the government expanded the evacuation zone to 15 km and re-located the evacuees who had been accommodated in emergency shelters within that zone to shelters outside of this new, expanded danger zone. Even more, with the pressure of a climbing death toll, when the 3 November eruption destroyed 2 villages and killed at least 31 people, the Indonesian president Susilo Bambang Yudhoyono ordered that people who refused to leave the danger zone would be evacuated by force.[163] Furthermore, the government declared a new policy whereby it would buy and evacuate livestock, especially cows, from villagers in the danger zones in order to prevent them from returning to tend to their livestock.[164]

The biggest eruption of Mount Merapi in more than a century took place on 5 November, which incinerated villages up to 18 km from the volcano and caused the danger zone to again be expanded, this time to 20 km from the volcano. People living between 15 and 20 km from the volcano were asked to evacuate. The government reported that 265,000 people lived within the 20 km danger zone and as of 5 November, a total of 160,000 people had been evacuated to government-run emergency shelters.[165] With government capacity strained by the massive rise of displaced persons, local civil society and businesses played an important role in assisting the huge number of evacuees by providing food and other emergency goods, sheltering many of the evacuees as well as volunteering in the evacuation centers.

After the 5 November eruption, the volcanic activity gradually subsided, yet many people, especially those whose villages had been destroyed, remained displaced for weeks and even months. The government slowly relaxed the danger zone and danger level requirements in the ensuing weeks and people started to return. The danger zone was reduced to between 5 and 15 km on November

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[162] Agence France-Presse (AFP), "Indonesian Volcano Explodes in New Eruption", 3 November 2010, http://www.reliefweb.int/rw/rwb.nsf/db900sid/MCOI-8AUH5M?OpenDocument

[163] Jakarta Post, "President Orders Use of Force to Evacuate People", 4 November 2010, http://www.thejakartapost.com/news/2010/11/04/president-orders-use-force-evacuate-people.html

[164] Jakarta Globe, "Government Stumps Up $11.2 Million to Buy Endangered Merapi Cows, 5 November 2010, http://www.thejakartaglobe.com/home/government-stumps-up-112-million-to-buy-endangered-merapi-cows/405063

[165] IRIN, "Indonesia: Thousands more to be evacuated from Merapi area", 5 November 2010, http://www.irinnews.org/Report.aspx?ReportID=90994

19[166] and on December 3 was reduced again to a 2.5 km radius around the crater.[167] Some people, especially those who needed to tend to their livelihoods, did not wait until the government relaxed the danger zone and danger levels and returned to their homes once the volcano seemed to have calmed down.

While allowing most people to return, the government warned people living in proximity of rivers to be cautious as lahars, or volcanic mudflows, would be likely and advised them to stay at least 300 meters away from rivers flowing down the flanks of volcanoes. Indeed lahars flooded several areas surrounding the volcano, forcing thousands of people to temporarily evacuate their houses and destroying several houses, bridges and roads.[168]

Some families, living in the immediate danger zone of the volcano, accepted the government's offer to resettle them to other parts of Indonesia. The government provided each family with six months of supplies, two acres of land, seeds for planting and a transportation allowance as part of the ongoing Indonesian transmigration program.[169] Since then, the majority of the affected population has returned or plans to return to their villages, and reconstruction of damaged and destroyed villages has begun. Based on joint assessment by Indonesia's National Disaster Management Agency (BNPB), the World Bank and UN Development Programme (UNDP), the total damage and losses from the Merapi volcanic disaster are expected to exceed four trillion rupiahs (an estimated $450 million).[170]

LESSONS LEARNED FROM THE MOUNT MERAPI ERUPTIONS

The case of Mount Merapi illustrates several important issues that need to be taken into account when organizing evacuations.

1. **Livestock and possessions:** The events at Mount Merapi show clearly that people's evacuation decisions are intimately linked to the safety of their possessions and in rural areas, especially to livestock. In many rural areas, livestock, especially large animals such as cows and buffaloes, act as "savings accounts" and people are very reluctant to abandon these resources. The conflict

166 Straight Times, "Merapi Danger Zone Reduced", 19 November 2010 http://www.straitstimes.com/BreakingNews/SEAsia/Story/STIStory_605062.html

167 The Jakarta Globe, "Alert Level Lowered as Indonesia's Merapi Settles Down", 4 December 2010, http://www.thejakartaglobe.com/home/alert-level-lowered-as-indonesias-merapi-settles-down/409979

168 The Jakarta Globe, "Flooding Pushes Yogyakarta Into a State of Emergency", 30 November 2010, http://www.thejakartaglobe.com/home/flooding-pushes-yogyakarta-into-a-state-of-emergency/409395 and Jakarta Post, "Magelang Lahar Flow Takes Bite Out of Highway to Yogyakarta", 25 January 2010, http://www.thejakartaglobe.com/home/magelang-lahar-flow-takes-bite-out-of-highway-to-yogyakarta/418802

169 Jakarta Post, "Merapi Survivors Offered Transmigration", 30 November 2010, http://www.thejakartapost.com/news/2010/11/30/merapi-survivors-offered-transmigration.html

170 The World Bank, "First Step Towards Post Merapi Reconstruction", 29 December 2010, http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/INDONESIAEXTN/0,,contentMDK:22799846~pagePK:1497618~piPK:217854~theSitePK:226309,00.html

resolution expert Casey Barrs has shown that in conflict situations, people are willing to accept great personal risk to their safety in order to save their livelihoods.[171] This dynamic is evident in natural disasters as well. Disaster preparedness and response activities need to take this reality into account. If possible, governments should also include the evacuation of livestock or compensation for any loss of livestock in their evacuation policies and measures. In addition, in preparing for and in carrying out evacuations, government authorities need to assure people that their property will be protected from theft and looting during their absence.

The more reassurances authorities and humanitarian organizations can give and fulfill that livelihoods will be protected, the more successful evacuations will be and the more smoothly they will proceed. The policy of the Indonesian government to evacuate livestock and to compensate the population was well-conceived and successful. For future disasters, national authorities and humanitarian agencies should strongly consider to proactively develop similar policies.

Even though it was a commendable and innovative policy, the reactive nature of the government of Indonesia's livelihood policy heavily reduced the effectiveness of that policy, as it was only implemented a full week after the eruptions began and was conceived in reaction to people endangering themselves by returning to their villages to tend to their livestock.

2. **Planning for the "Big One":** Even the best predictive tools do not allow precise predictions of the scale of natural disasters and reliance on past experience is not always the key to handle the next disaster successfully. In Yogyakarta, while the signs were fairly clear from scientific observations of the volcano that the eruption would be a major one, few predicted that it would be the biggest eruption in 150 years. The fact that emergency shelters were close to the evacuation zone, which is in accordance with good practice proposed by the *IASC Operational Guidelines on the Protection of Persons in Situations of Natural Disasters* (see below), posed major problems given the once-in–a-century scale of this eruption and meant that the authorities needed to relocate most of the evacuees and improvise emergency shelters. The massive number of evacuees caused by the expansion of the danger zone from 10 km to 20 km at times strongly challenged the capacity of the government to respond. Fortunately, Indonesian civil society stepped in with great solidarity and assisted the government's efforts to provide for the needs of the evacuees.

   Although volcanic eruptions are not related to climate change, the fact that climate change is likely to increase the frequency and severity of hydrometeorological disasters in the future means many disaster preparedness plans for disasters may be overwhelmed by the scale of future developments. "Once-in-a-century disasters" could well occur more frequently and local, regional, and global disaster management systems need to be prepared for those large-scale disasters. Therefore, governments, humanitarian actors and other relevant actors should prepare

171 Casey Barrs, *How Civilians Survive Violence: A Preliminary Inventory*, The Cuny Center, September 2010

contingency plans for the "Big One" to ensure that large numbers of people that might be affected by such a major disaster can be evacuated, sheltered and fed.

3. **A question of authority and training:** When people believe that government authorities are capable and competent, they are more likely to follow those authorities' recommendations and orders. Threats may be assessed very differently by different people and some individuals may consider government assessments to be too cautious or will for a variety of reasons wait until the last possible minute to leave their homes in the face of imminent danger. Disaster management thus needs to start at the local level. Neighborhood and village leaders can play an important role in mobilizing the population in the face of disasters and should be trained and involved in disaster preparedness and disaster management duties. Disaster exercises and drills at the local level, such as in schools, will build up competence of both authorities and evacuees themselves on the local level and will allow evacuations to proceed more smoothly.

   Another issue in many societies is widespread skepticism towards the government and/or modern science, with people having more trust in traditional authorities and leaders (elders, religious and spiritual leaders, for example). In Yogyakarta, many people believed in the predictions and warnings of the "spiritual gatekeeper" of the volcano rather than in the warnings of the Indonesian Volcanology and Geological Disaster Mitigation Agency and refused to leave their villages until the "gatekeeper" issued an evacuation warning or left his own village located less than 5 km from the crater. In Yogyakarta, unfortunately the episode ended badly as the "gatekeeper" refused to evacuate and together with more than ten others (some of whom were at his house to convince him to evacuate), was killed by hot gases during one of Merapi's first major eruptions.

   Rather than discounting traditional leaders' knowledge, government authorities should try to use the knowledge and prestige of traditional authorities to provide for the safety and security of affected populations.

4. **Communication and coordination:** Successful evacuations are based on well-executed communication and coordination. Early warning systems need to transmit the data to the disaster management agencies and authorities in a timely fashion and a warning system needs to be in place that can reach all communities, including remote ones. The better people are informed beforehand about hazards, evacuation procedures and evacuation routes, the more successful evacuations will proceed. Effective coordination between different levels of government, the military, first responders, humanitarian actors, civil society and the affected population will allow for successful evacuations, minimizing the harm posed by natural hazards.

To assist humanitarian actors and national authorities the UN's IASC developed *Operational Guidelines on the Protection of Persons in Natural Disasters*, which include criteria to ensure that mandatory evacuations are carried out in accord with international human rights standards, including the following:

1. The life, physical integrity and health of persons exposed to imminent risks created by natural disasters, including in particular of persons with specific needs, should be protected, to the maximum extent possible, wherever those persons may be located.

2. If such measures are not sufficient to protect them, the departure of endangered persons from the danger zone should be facilitated.

3. To the extent that endangered persons cannot leave on their own they should be evacuated from the danger zone.

4. Persons unwilling to leave should not be evacuated against their will unless such forced evacuation
   a. is provided for by law;
   b. is absolutely necessary under the circumstances to respond to a serious and imminent threat to their life or health, and less intrusive measures would be insufficient to avert that threat; and
   c. is, to the extent possible, carried out after the persons concerned have been informed and consulted.

5. Evacuations, whether voluntary or forced, should be carried out in a manner that fully respects the rights to life, dignity, liberty and security of those affected and that does not discriminate against anyone. To the extent possible, the people concerned should be informed, in a manner that is accessible to them and in a language they can understand, of the likely duration and process of the evacuation as well as the reasons why it is necessary.

6. Persons who leave or are evacuated should be supported to stay as close to their places of habitual residence as the security/safety situation allows.

7. The designated evacuation centres or temporary shelter zones, which affected persons are brought to or received in, should be safe and not expose them to further risk. They should provide living conditions that respect the dignity of the persons concerned.

8. International and non-governmental organizations providing protection and assistance should not carry out or participate in forced evacuations, unless an imminent and serious threat to the lives, physical integrity or health of the evacuees cannot be averted without the involvement of the organizations concerned.

9. The right to freedom of movement of affected persons, whether or not displaced, should be respected and protected. This right should be understood as including the right to freely decide whether to remain in or to leave an endangered zone. It should not be subject to restrictions except those which are: (i) provided for by law, (ii) serve exclusively the purpose of protecting

the safety of the persons concerned, and (iii) are used only when there are no other less intrusive measures. In the case of evacuations, temporary relocation should not last longer than absolutely necessary.

10. Internally displaced persons should be granted the right to choose freely whether they want to return to their homes and places of origin, to integrate locally in the area to which they have been displaced, or to settle elsewhere in the country. Appropriate measures, such as consultation, information campaigns and go-and-see visits should be taken to enable such persons to take an informed decision in this regard.[172]

While these guidelines provide good guidance on how to safeguard the human rights of persons affected by natural disasters in the course of evacuations, it will still be the authorities which will have to make the often difficult decision of whether and when to evacuate. Effective disaster-preparedness measures coupled with strong coordination and communication systems will make this task easier. If people are well-informed about the hazards they are facing and about how to evacuate danger zones quickly, and if provisions are made to protect their livestock and livelihoods, there is a greater likelihood that they will comply with evacuation orders. Furthermore, the need to forcibly evacuate people from disaster zones is likely to lessen as citizens make better informed decisions and are more comfortable with the provisions made for evacuees.

[172] Brookings-Bern Project on Internal Displacement, *IASC Operational Guidelines on the Protection of Persons in Situations of Natural Disasters*, January 2011, p. 55 and p. 15ff and p 45f

SECTION 2: THE YEAR OF GROUNDED AIRPLANES

Although statistically an average year for volcano eruptions, one particular eruption generated major headlines. This was the largest eruption of the year, the Icelandic volcano with the difficult name of Eyjafjallajökull. The eruption catapulted volcanic tephra up to 9 km into the atmosphere and formed an ash-cloud which hovered over large parts of Europe. The most serious effect of this volcanic eruption was its disruption of European air travel, with up to 100,000 flights cancelled and large portions of European airspace from Spain to Finland closed for days, causing more than $2 billion in economic damage.[173]

Previous encounters of planes with volcanic ash have demonstrated the extent of this danger to aircraft. In the 1982 eruptions of the Galunggung Volcano in Java, Indonesia, a British Airways 747 encountered ash and lost all engine power. After a descent of 24,000 feet, the crew managed to restart some of the engines again and land the plane safely. In 1989 Alaska's Mount Redoubt erupted and caused a similar loss of all engines in a KLM jet, which also managed to restart engines after a steep descent. One of the earlier cases of volcanoes impacting aircrafts happened in 1944, when tephra from Mount Vesuvius in Italy disabled a whole fleet of 88 B-25 bombers, which represented the largest single loss of American aircraft in World War II (64 planes were destroyed in Pearl Harbor)[174].

Not wanting to risk the safety of air passengers after receiving warnings from the Volcanic Ash Advisory Centre in London, many national government agencies closed down airports in mid-April and again in early May, leading to the biggest shutdown of airspace and airports since World War II. Indeed, the closing of airports because of volcanic ash is not unprecedented in aviation history. Statistics show that from 1944 through 2006 at least 101 airports in 28 countries were affected on 171 occasions by eruptions of 46 volcanoes. Since 1980, five airports per year on average have been affected by volcanic activity. Ten countries—the United States (including trusts and commonwealths) 33, New Zealand 21, Ecuador 15, Indonesia 13, Italy 12, Philippines 12, Papua New Guinea 11, Mexico 8, Japan 8, and the United Kingdom 6—have the highest volcanic hazard and/or vulnerability measures for airports.[175]

However, the massive scale of airport closures due to the eruptions of Eyjafjallajökull coupled with airport closures because of Merapi made 2010 by far the year of the most airport closures, followed by 1991, which had 16 impacted airports (mostly because of the major eruptions of Mount Pinatubo and Mount Hudson). In comparison, France alone closed 24 airports on April 15, 2010, and Ger-

173 Air Transport World, "European Commission Outlines Airspace Closure Relief Measures", 28 April 2010, http://atwonline.com/international-aviation-regulation/news/european-commission-outlines-airspace-closure-relief-measures
174 Peter Brooker, "Fear in a handful of dust: Aviation and the Icelandic volcano", *Significance*, September 2010, p.112
175 Marianne Guffanti et al., "Volcanic Hazards to Airports", *Natural Hazards*, 2009, 51:287-302, page 287–288

many closed all 16 international airports on April 17.[176] Although we possess no cumulative numbers of how many airports were closed at the height of the crisis, the number is likely to be above 100.[177]

The massive expansion in air travel in recent decades has increased the number of flights and airports which can be affected by volcanic eruptions. To mitigate the risk, Volcanic Ash Advisory Centres (VAACs) located within national meteorological agencies have been created. Currently nine such centers exist, monitoring nine corresponding regions. In the US, the VAACs in Anchorage and Washington were created in 1997.[178] If a volcano erupts, the centers pass along warnings to meteorological centers and other authorities, who then decide on the national level about airspace and airport closures. This means that despite having a uniform warning system there are no agreed upon standards on when to ground planes in case of volcanic ash. Even in Europe, probably the most politically and economically integrated region in the world, there were contentious debates about the level of ash concentrations at which it was safe for planes to fly.

As a direct response to the flight disruptions, the European Council developed a new approach to risk management, based on a three-zone scheme defining a no-fly zone, a zone with possible flight restrictions and a zone without restrictions, according to the concentration of ash. The scheme is based on scientific assessment updated every six hours by the VAAC London.[179]

The Council also agreed to the "establishment by the relevant authorities responsible for flight safety of binding limit values, at EU level, which clearly define the safety envelope of engines and aircrafts as regards the risk of volcanic ash".[180] While engaging with aircraft and engine makers to develop a certification process for aircrafts in regard to volcanic ash safety, an actual ash concentration level of up to 4,000 micrograms/m3 was seen as a preliminary tolerable limit for airplanes.[181]

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176 Deutsche Flugsicherung GMBH, " Deutsche Flughäfen bis 14 Uhr geschlossen Keine Starts und Landungen bis Samstag / Überflüge wieder möglich", 17 April 2010

177 CBS News, "Iceland Volcano Ash Upends Air Travel in Europe, 15 April 2010, http://www.cbsnews.com/stories/2010/04/15/world/main6399826.shtml

178 A. J. Prata, A. Tupper, "Aviation Hazards from Volcanoes: the State of Science", *Natural Hazards*, 2009, 51:239-244, (VAACs are situated in Anchorage, Montreal, London, Washington, Wellington, Buenos Aires, Toulouse, Tokyo and Darwin)

179 Council of the European Union, Extraordinary Council meeting Transport, Telecommunications and Energy, Press Release, Brussels, 4 May 2010, 9280/10 (Presse 98); See also: European Commission, Mobility and Transport, *Report on the Actions Undertaken in the Context of the Impact of the Volcanic Ash Cloud Crisis on the Air Transport Industry*, 30 June 2010, http://ec.europa.eu/transport/doc/2010_06_30_volcano_crisis_report.pdf

180 European Commission, Mobility and Transport, *Report on the Actions Undertaken in the Context of the Impact of the Volcanic Ash cloud Crisis on the Air Transport Industry*, 30 June 2010, http://ec.europa.eu/transport/doc/2010_06_30_volcano_crisis_report.pdf, See also: New York Times, "European Union Agrees to Accelerate Joint Control of Skies, 2 May 2010, http://www.nytimes.com/2010/05/05/world/europe/05ash.html

181 European Commission, Mobility and Transport, *Report on the actions undertaken in the context of the impact of the volcanic ash cloud crisis on the air transport industry*, 30 June 2010, http://ec.europa.eu/transport/doc/2010_06_30_volcano_crisis_report.pdf; see also: Christian Science Monitor, "Volcanic ash cloud: Where Is It now - May 23?", 23 May 2010, http://www.csmonitor.com/World/Global-News/2010/0523/Volcanic-ash-cloud-Where-is-it-now-May-23

The International Air Transport Association (IATA) estimated that airline carriers lost $1.7 billion in revenues in total, peaking at about $400 million per day.[182] In addition to lost airfares, the airlines were forced to spend millions of dollars for hotel/food and other passenger assistance costs which was estimated at more than double the amount saved in fuel costs because of the grounding of planes. Additional losses to airports and businesses make the Eyjafjallajökull eruption one of the 15 most expensive natural disasters in 2010. Interestingly, while EM-DAT includes the event in its database, it does not provide any estimate of the number of persons affected by the disaster or data on economic damages. This dearth of data poses the question of whether the more than 10 million airline passengers, many of whom were stranded at airports for days, should be considered as disaster-affected persons. Even following EM-DAT's narrow definition,[183] many of the stranded passengers were clearly in need of food, shelter and assistance. And certainly most of the stranded passengers saw themselves as affected by the disaster.

FINAL POINTS

While 20–30 volcanoes on average erupt each year, many of them do so in scarcely-populated areas, which means that only an average of 6 qualify as disasters and are recorded in the EM-DAT natural disaster database. To put these events in greater context, major eruptions above VEI 4 take place even more infrequently than the earth experiences earthquakes above 8 on the Richter scale. Still, 2010 shows us that VEI 4 eruptions like Merapi and Eyjafjallajökull can cause severe and far-reaching damage, both in terms of human lives and health and in economic terms. Modern scientific and technological advancements in monitoring volcanoes and volcanic ash have given authorities a fair edge when it comes to early warnings of volcanic danger. Still, as evidenced by events in Indonesia last year and elsewhere in the past, this technology does not yet allow us to completely prevent human casualties during major eruptions. As the world's population continues to grow and land becomes increasingly scarce in many countries, we can project that the slopes of the world's volcanoes will become more populated in the coming years. Most people living on the slopes of active volcanoes are aware of the hazard they face, and because of the higher predictability of volcanic eruptions compared with other natural disasters it should be possible for governments and humanitarian actors to prepare properly for the occurrence of eruptions and so to mitigate the negative effects they cause. As experience has shown, the more closely local and national authorities involve the affected populations in preparedness efforts, the more resilient societies will become to volcanic eruptions and other natural hazards.

For as Immanuel Kant observes, we can only enjoy the sublime when we are at a safe distance from the erupting volcano.

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182 Robert Wall, Jens Flottau,"Volcanic Residue; System Reform, Rather than Bailouts Dominates Transport ministers' agenda", Aviation Week & Space Technology, May 10, 2010

183 EM-DAT considers disaster-affected persons to be "people requiring immediate assistance during a period of emergency, i.e. requiring basic survival needs such as food, water, shelter, sanitation and immediate medical assistance." EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium, www.emdat.be

CHAPTER 4 :
THE "RENTERS' DILEMMA"

RENTERS ARE AN OFTEN UNDERSERVED VULNERABLE GROUP IN POST-DISASTER SHELTER SOLUTIONS

More than one year after the dramatic earthquake in Haiti no comprehensive strategy for shelter reconstruction has yet been presented by the Haitian government or the international community. One reason among many for the slow process of shelter reconstruction in Haiti is the fact that 70–80 percent of the population of Port-au-Prince rent their homes rather than own them.[184] Given the reality that most urban residents lost not only their housing, but also suffered severe loss of livelihoods and income,[185] most renters do not have the means to return to their former houses and apartments. Nor do they have an incentive to rebuild them as the property belongs to others.

Experiences from many post-disaster reconstruction processes, including post-tsunami Aceh and post-Katrina New Orleans, show us that humanitarian shelter strategies are usually based on the principle of compensation and reconstruction aid for those who owned property before the disaster. Renters who lose their housing because of disasters are often the economic losers in the reconstruction process because the system shows a strong bias towards property owners and tends to overlook the plight of renters, many of whom were socioeconomically marginalized before the onset of the disaster. In an era in which urban populations are increasing and where renters make up a large proportion of the urban population, this is a situation which merits further attention.

Those displaced by natural disasters (as well as those displaced because of conflict or development projects) have a right to durable solutions to their displacement. As spelled out in the UN *Guiding Principles on Internal Displacement*,[186] these solutions include: return to their community of origin, integration into the community to which they have been displaced or settlement and integration elsewhere in the country. While return is the solution desired by most of those displaced by natural disasters, when homes have been destroyed or damaged by the disaster, reconstruction is required before they can exercise their right to return. The reconstruction of rental units poses particular difficulties in the recovery process. Based primarily on experience with reconstruction in both Aceh

184 Note that in early 2011, various international agencies working in Haiti were in the process of finalizing a strategy on renters

185 In addition, many had paid the rent for months in advance at the beginning of January, only days before the earthquake struck. World Vision, "A Place to Call home, Despite the Challenges of Rebuilding in Haiti", 23 December 2010, http://www.worldvision.com.au/issues/emergencies/current_emergencies/haitiearthquake/APlaceToCallHome.aspx

186 UN Office for the Coordination of Humanitarian Affairs (OCHA), *The Guiding Principles on Internal Displacement*, E/CN.4/1998/53/Add.2, 1998, www.brookings.edu/projects/idp/gp_page.aspx

and New Orleans, this chapter examines some of the main issues facing renters in post-disaster situations and considers some possible solutions to the "Renters' Dilemma". Before we look at the challenges that renters are facing in post-disaster situations we briefly examine some of the human rights provisions related to housing in international human rights law.

SECTION 1: HOUSING RIGHTS IN INTERNATIONAL HUMAN RIGHTS LAW

Under international human rights law, persons affected by natural disasters possess a series of housing, land and property rights and governments are required to respect and protect those rights. Both the *Universal Declaration of Human Rights* (Article 25) and the *International Covenant on Economic, Social and Cultural Rights* (Article 11) lay down the right to an adequate standard of living, including in terms of adequate housing. Every human being is entitled to those rights; they are not contingent upon an individual's housing status.

International human rights law also includes other important rights and provisions related to housing, including, among others, the right to property, the right to freedom of movement and to choose one's residence, and the right to return to one's home. The *Convention on the Elimination of Racial Discrimination* also stipulates that States Parties "undertake to prohibit and to eliminate racial discrimination in all its forms," thereby ensuring all individuals' rights to housing "without distinction as to race, colour, or national or ethnic origin."[187] The Center on Housing Rights and Evictions (COHRE)'s legal and advocacy work, which focuses on the application of international human rights law to housing rights, stressing individuals' rights to "protection from forced evictions and the destruction or demolition of one's home" as a result of a wide array of circumstances in a changing contemporary context, "including in situations of military occupation, international and civil armed conflict, establishment and construction of alien settlements, population transfer, and development projects."[188]

To strengthen the application of international human rights norms, the past few decades have witnessed the development of principles and guidelines that lay down the housing and property rights for persons displaced by natural disasters and/or conflict, including minimum standards that should guide states and humanitarian actors to respect the basic housing rights provisions in human rights law. These include the UN *Guiding Principles on Internal Displacement*[189], the IASC *Operational*

[187] UN General Assembly, *International Convention on the Elimination of All Forms of Racial Discrimination*, 21 December 1965, United Nations, Treaty Series, vol. 660, p. 195, available at: http://www.unhcr.org/refworld/docid/3ae6b3940.html
[188] COHRE, "About Us" and "What Are Housing Rights?", http://www.cohre.org/
[189] UN Office for the Coordination of Humanitarian Affairs (OCHA), *The Guiding Principles on Internal Displacement*, E/CN.4/1998/53/Add.2, 1998, www.brookings.edu/projects/idp/gp_page.aspx

Guidelines on the Protection of Rights in Situations of Natural Disasters[190], *the Pinheiro Principles*[191], the *Sphere Standards*[192], the *Report of the Special Rapporteur on adequate housing as a component of the right to an adequate standard of living, and on the right to non-discrimination in this context (2009)*[193], and the Council of Europe's *"Guidelines on Supply of Housing, Financing and Housing Allowance*[194].

All of these guidelines clearly stress the universal right to adequate housing. In addition, the *Pinheiro Principles*[195] and the IASC *Operational Guidelines*[196] stress the need to ensure the rights and participation of renters/tenants in the process of restitution and reconstruction.

Although the human rights provisions are clear, questions remain about the extent to which these principles have been translated into practice during the post-disaster reconstruction process. The following section begins with a review of implementation of housing rights for renters in a variety of post-disaster settings. This will be followed by a more detailed examination of the cases of Aceh after the Indian Ocean tsunami and New Orleans after Hurricane Katrina.

SECTION 2: THE "RENTERS' DILEMMA" IN POST-DISASTER SITUATIONS – SOME EVIDENCE

Many post-disaster responses have failed to incorporate the particular situation of renters, with the result that durable solutions were often more difficult to achieve for renters than for property owners. In fact, there is strong evidence that many post-disaster reconstruction schemes show a strong bias, intended or otherwise, towards property owners.

In Indonesia, after the Yogyakarta earthquake in 2006, which destroyed and damaged more housing than the tsunami in Aceh, community-based reconstruction proceeded relatively smoothly in

190 Brookings-Bern Project on Internal Displacement, *IASC Operational Guidelines on the Protection of Persons in Situations of Natural Disasters*, January 2011

191 COHRE, *The Pinheiro Principles, United Nations Principles on Housing and Property Restitution for Refugees and Displaced Persons*, 2003

192 The Sphere Project, *Humanitarian Guidelines and Minimum Standards in Disaster Response*, 2004, http://www.sphereproject.org/dmdocuments/handbook/hdbkpdf/hdbk_full.pdf, p. 207

193 Commission on Human Rights, "Report of the Special Rapporteur on adequate housing as a component of the right to an adequate standard of living, and on the right to non-discrimination in this context", Miloon Kothari, UN Document A/64/255 (2009), Paragraph 64, http://ap.ohchr.org/documents/alldocs.aspx?doc_id=15881

194 Council of Europe, *Guidelines on Supply of Housing, Financing and Housing Allowance*, 8 Jun 2006, http://www.coe.int/t/dg3/socialpolicies/socialrights/2006cshoguidelines_EN.asp#guidelines

195 COHRE, *The Pinheiro Principles, United Nations Principles on Housing and Property Restitution for Refugees and Displaced Persons*, 2003

196 Brookings-Bern Project on Internal Displacement, *IASC Operational Guidelines on the Protection of Persons in Situations of Natural Disasters*, January 2011, p. 39

rural areas, where land rights issues were clearer than in urban areas. Reflecting the preponderance of renters in urban areas, one study on reconstruction efforts observed that, "the reluctance of both government and international agencies to support rental housing or enter into complex ownership issues, meant that rural areas tended to receive more support and thus to recover more successfully than urban or peri-urban areas."[197]

An International Federation of Red Cross and Red Crescent Societies (IFRC) report found that in post-tsunami Sri Lanka, many landless renters simply failed to appear on official beneficiary lists, an indication that they were effectively excluded from assistance. The report also states that "according to IFRC officials in Sri Lanka, in 2008 there remain perhaps as many as 20,000 households (100,000 persons) which have received no direct assistance to repair or rebuild houses damaged by the Tsunami."[198]

After the Pisco earthquake in 2007 in Peru, families whose homes were destroyed were entitled to receive a voucher worth around $2,000 to buy housing materials. Eligible families needed to prove ownership of their homes through legal title to receive the reconstruction funds. But many affected families either did not have formal land titles or were tenants which meant that they could not start the reconstruction of their homes.[199] It is also evidence of the perhaps unintentional discrimination against the poor which is often evident in reconstruction efforts around the world.

Following the 1995 Kobe earthquake in Japan homeowners were entitled to return to their pre-quake homes, while tenants were often forced to find new housing as their former neighborhoods were transformed into new and more expensive areas.[200]

RENTERS AND SQUATTERS IN POST-TSUNAMI RECONSTRUCTION IN ACEH

The tsunami in Aceh left 500,000 people homeless. More than 250,000 houses and some 300,000 parcels of land were totally or partially damaged and most land records in the area were destroyed or rendered illegible. To sort out the issue of land titles, based on a proposal of the Land Title Office (BPN), the Multi-Donor Fund commissioned a project named RALAS (Reconstruction of Aceh's Land Administration System) which was tasked with the reconstruction of property rights through "community-driven adjudication" and the issuance of land titles. The process was complicated by land disputes among community members or returning family members, opportunistic land-grab-

197 Graeme MacRae, *David Hodgkin, Half full or half empty? Shelter after the Jogjakarta earthquake*, Disasters 2011, 35 (1), p. 252

198 Scott Leckie, IFRC, Displacement Solutions, Housing, *Land and Property (HLP) Rights in Post-Disaster Settings: Proposals for IFRC Shelter Policy and Response,* 1 October 2008, p. 12

199 Samir Elhawary and Gerardo Castillo, "The Role of the Affected state: A case Study on the Peruvian Earthquake Response", HPG Working Paper, April 2008, http://www.odi.org.uk/resources/download/1213.pdf, p. 20

200 IFRC, Displacement Solutions, Housing, *Land and Property (HLP) Rights in Post-Disaster Settings: Proposals for IFRC Shelter Policy and Response,* Scott Leckie, 1 October 2008, p. 26

bers and uncertain inheritance rights. But in spite of these difficulties, on the whole the approach proved to be effective.[201] Once land titles were re-established, reconstruction and resettlement of the tsunami displaced, most of who were living in tents or temporary barracks, could begin. The Government of Indonesia's Rehabilitation and Reconstruction Agency's (BRR) policy on reconstruction stipulated that previous home owners would receive basic houses on their former land once land titles were re-issued. Furthermore, the approximately 35,000 families whose land was submerged by the tsunami and who therefore could not return would be resettled to new locations.[202]

The policy became problematic, however, when it came to the rights of an estimated 15,000 households who did not own land before the tsunami as they were either renters or squatters. For these groups, who were overlooked in the initial master-plan, the BRR decided in 2006 that pre-tsunami renters would receive approximately $2,800 and pre-tsunami squatters approximately $1,150. Renters and squatters could then use this cash as a deposit for a loan to obtain ownership of BRR land and housing.[203] Many actors in the recovery community strongly criticized this decision on the grounds that it was inadequate for those who were landless, many of whom were among the most vulnerable and asset-poor households. Indeed, in 2006 almost 20,000 of the 70,000 individuals remaining in temporary shelter two years after the disaster were renters and squatters; many of them had not received any housing assistance up until that point. With the BRR planning to close all emergency barracks by June 2007, the renters and squatters were even threatened by eviction.

The issue could have been addressed earlier but it seems that initial assessments had not taken into consideration the number of renters and squatters in the community, but rather had assumed that those who had lost housing had owned the houses in which they lived. Only after demonstrations by affected renters and squatters and concerns voiced by humanitarian actors was the policy changed in February 2007—more than two years after the tsunami. The revised policy stipulated that renters and squatters would receive free land and housing. The areas of Labuy and Neuhue, near the capital of Banda Aceh, were designated as resettlement sites specifically for this group and in addition assistance was provided to 1,000–2,000 renters elsewhere who bought land but required financial assistance to build a house.[204] The resettlement of many of the renters and squatters in Labuy and Neuhue posed a whole new set of problems as the sites were located far away from livelihoods, a fair distance from the capital Banda Aceh and were located in an area where freshwater was scarce. Some international NGOs also expressed concern that social cohesion would be a problem because those households resettled together in Labuy and Neuhue came from disparate communities across

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201 Lilianne Fan, World Bank, *The Struggle for Land Rights in Post-Tsuanmi and Post-Conflict Aceh, Indonesia*, Land Policies and Legal Empowerment of the Poor 2–3 November 2006, p. 10

202 Lilianne Fan, World Bank, *The Struggle for Land Rights in Post-Tsuanmi and Post-Conflict Aceh, Indonesia*, Land Policies and Legal Empowerment of the Poor 2–3 November 2006, p. 12

203 Lilianne Fan, World Bank, The Struggle for Land Rights in Post-Tsunami and Post-Conflict Aceh, Indonesia, 2–3 November 2006

204 Jo da Silva, ARUP, *Lessons from Aceh, Key Considerations in Post-Disaster Reconstruction*, 2010, www.dec.org.uk/download/721/lessons-from-aceh.pdf

the region and were therefore separated from familiar social networks and living among unfamiliar faces.[205]

While the research for this report did not find any evidence pointing to social conflict among the resettled renter and squatter families, there are reports that 50 out of the 300 houses provided by the Asia Development Bank for renters and squatters in Labuy were illegally occupied by persons ineligible for free housing, which meant that many families remained in emergency barracks more than five years after the tsunami. The Acehnese government formed an inter-agency task-force in November 2010 with the aim of resolving the issue.[206] The involved parties are at this point still waiting for the task-force's results.

THE NEGLECTED RENTERS OF NEW ORLEANS POST-KATRINA

As renters accounted for more than half of the population of New Orleans before Hurricane Katrina struck in 2005, the issue of finding solutions for them took on particular importance during the recovery period. The hurricane caused major damage to New Orleans rental units, many of which had been occupied by the poorest individuals and families. Across the New Orleans metropolitan area, nearly 228,000 homes were damaged or destroyed; overall 39 percent of owner-occupied units and 56 percent of rental units were damaged or destroyed by flooding.[207]

The Louisiana and Mississippi governments' owner-based and market-driven approach to reconstruction in New Orleans has heavily neglected the rental sector. The Housing Authority of New Orleans (HANO)'s demolition of New Orleans' "Big Four" public housing developments and subsequent construction on these grounds of new mixed-income housing by private companies has precluded many poor families from returning.[208] The example of the new Columbia Parc complex, constructed on the grounds of the former St. Bernard Housing Development which provided 963 public housing units is instructive, with the new complex offering less than 500 apartments, only 157 of these serving as subsidized public-housing units with income-based rent.[209] While HANO

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[205] Ainy Fauziyah, OXFAM, "Land Rights, Renters, Squatters and Barracks", PowerPoint Presentation, www.unhabitat-indonesia.org/files/rep-639.pdf

[206] Serambi Indonesia, "Penyerobot Rumah Korban Tsunami Akan Diadili", 30 November 2010, http://aceh.tribunnews.com/news/view/43820/penyerobot-rumah-korban-tsunami-akan-diadili,and: Jakarta Globe, "Bitterness for Some Over Long Wait for Post-Tsunami Housing", 26 December 2009, www.thejakartaglobe.com/indonesia/bitterness-for-some-over-long-wait-for-post-tsunami-housing/349350, and: Jakarta Post, "Tsunami Victims Still in Shelters", 26 December 2009, www.thejakartapost.com/news/2009/12/26/tsunami-victims-still-shelters.html

[207] The Brookings Institution Metropolitan Policy Program, "New Orleans After the Storm: Lessons from the Past, a Plan for the Future", 2005, www.brookings.edu/metro/pubs/20051012_NewOrleans.pdf, p. 14

[208] Tiffany M. Gardner, Alec Irwin, and Curtis W. Peterson. "No Shelter from the Storm: Reclaiming the Right to Housing and Protecting the Health of Vulnerable Communities in Post-Katrina New Orleans", *Health and Human Rights* 11.2, 2009, p. 108

[209] WWLTV.com Eyewitness News "Mixed-Income Housing Development Replaces St. Bernard Projects", 12 Apr 2010, http://www.wwltv.com/news/Mixed-income-housing-development-replaces-St-Bernard-complex-90703594.html

boasts of the new mixed-income housing project's crucial role in the "redevelopment" of these communities, the short-term fate of renters who had resided in public housing appears bleak.[210]

While reconstruction in New Orleans focused (and was much criticized as a result) on home owners, there were efforts to address the needs of renters through the Louisiana Recovery Authority (LRA) and other initiatives.[211] The LRA's Small Rental Property Program offered direct loans or loan incentives only to owners of rental property. Espousing the mixed-income housing approach as "a nationwide best practice," the LRA's renter-focused assistance came only in the form of Community Development Block Grant (CDBG) funding, by which the state government ensured that just over 50 percent of these mixed-income units were considered "affordable housing." Many of these units, however, were reportedly being rented at market rates.[212] Furthermore, as of 2009 New Orleans was only prepared to rebuild around one-third of rental housing units which would be affordable for low-income individuals.[213] In addition, the U.S. Department of Housing and Urban Development decided to demolish 4,500 damaged rental units after the disaster.[214]

Similarly, in neighboring Mississippi a program of homeowner restitution was implemented. Only after aggressive advocacy did the Mississippi Development Authority create assistance programs for rental units. Assistance was to be given to the landlords and not the tenants. The small rental assistance program budgeted at $262.5 million offered incentives for small-scale rental property owners (defined as owning between one and four rental units) for repair and reconstruction of rental units. Landlords participating in the program had in turn to agree to rent a certain percentage of the units to low-income families. Another program subsidized developers of low-income rental housing by providing a complex system of tax credits. In exchange for these credits, developers had to agree to restrict the rent charged on a percentage of their units for a specified period of years and to dedicate those units only to tenants who meet income limits.[215] Overall, not more than five percent of all reconstruction money was designated to rental housing.[216]

Not surprisingly, after the disaster, prices for the remaining available rental units soared. The fair market rent calculated by the HUD for a two-bedroom apartment rose from $676 per month prior

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210 *Housing Authority of New Orleans*, HANO, 2010. Web. 20 Feb. 2011, http://www.hano.org/index.php?q=node/2

211 For further analysis of the particular difficulties facing renters, see PolicyLink's evaluation report, *Bringing Louisiana Renters Home*, June 2007, http://www.policylink.org/site/apps/nlnet/content2.aspx?c=lkIXLbMNJrE&b=5136581&ct=6997477

212 Louisiana Recovery Authority, "Rental Programs", www.lra.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=118

213 Facing South, "4 Years After Katrina: Housing Crisis Continues, Low-income Renters Face Discrimination", 21 August 2009

214 Charles W. Gould, "The Right to Housing Recovery After Natural Disasters", *Harvard Human Rights Journal*, Vol. 22, p.189

215 John Jopling, *Two Years After the Storm, The State of Katrina Housing Recovery on the Mississippi Gulf Coast*, March 2008, *Jon Jopling Law Review*, p. 885f

216 Ibid p. 887

to Katrina to $978 two years later, an increase of 45 percent.[217] This also explains part of the fact that of the approximately 200,000 people who had not returned to New Orleans by the one-year mark following the Hurricane, 70 percent were African-American and 38 percent lived below the poverty line.[218] Rent increases are compounded by the reality that new private rental companies are hesitant to accept federal housing vouchers, particularly given that new renters tend to be young professionals or non-locals seeking to rent on a short-term basis. Developers of the mixed-income projects are aware of their new renters' desire to rent alongside similar neighbors and thus generally choose to accommodate them.[219] The 2010 census figures show that New Orleans has 29 percent fewer inhabitants than it had in 2000, the majority of the loss being 118,000 African-American residents compared to a loss of 24,000 Caucasian residents.[220]

Minorities and vulnerable groups displaced by Hurricane Katrina who had already suffered from myriad socioeconomic challenges prior to the storm have suffered the most from the inability to rent affordable housing in their former communities. As 90 percent of neighborhoods dominated by public housing were populated by African Americans of which 80 percent in those areas were renters, it is nearly impossible to divorce discussions of the marginalization of renters from racial and ethnic minority issues.[221] Other groups particularly affected by the poor availability of affordable rental housing include disabled and elderly populations. *The New York Times* reported that a third of those individuals renting Federal Emergency Management Agency (FEMA) apartments in Houston were elderly or disabled, a third earned their livelihoods from primarily low-wage positions, and third of these were also still seeking employment, making these individuals "the least equipped to start over."[222] Women also disproportionately hold the burden of navigating the social, legal and economic barriers to finding affordable rental housing. The U.S. Department of Housing and Urban Development (HUD) reported in 2004 that women headed 77 percent of public housing households, and 88 percent of voucher-subsidized housing units.[223]

The difficulty of finding affordable rental property has discouraged the return of many individuals and families displaced by Hurricane Katrina. Whereas 75 percent of homeowners who had evacuated "damaged but still livable properties" returned to them within a month of the hurricane, the rate

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217 Charles W. Gould, "The Right to Housing Recovery After Natural Disasters", *Harvard Human Rights Journal*. Vol. 22, p.189

218 Charles W. Gould, "The Right to Housing Recovery After Natural Disasters", *Harvard Human Rights Journal*,Vol. 22; For differences in poverty figures in New Orleans see: Rogelio Saenz, Population Reference Bureau, "Beyond New Orleans: The Social and Economic Isolation of Urban African Americans", October 2005

219 New York Times, "In New Orleans, a Test of Mixed-Income Housing", 21 November 2007, http://www.nytimes.com/2007/11/21/realestate/commercial/21orleans.html

220 New York Times, "Smaller New Orleans After Katrina, Census Shows", 3 February 2011

221 Logan, John, Brown University, "The Impact of Katrina: Race and Class in Storm-Damaged Neighborhoods", 2006, http://wps.ablongman.com/wps/media/objects/6948/7114754/pdf/Report_2.pdf

222 New York Times, "Road to New Life After Katrina Is Closed to Many", 12 July 2007, http://www.nytimes.com/2007/07/12/us/nationalspecial/12exile.html

223 Institute for Women's Policy Research, "Mounting Losses: Women and Public Housing After Hurricane Katrina", Aug 2010, http://iwpr.org/pdf/D491.pdf

of return of renters was less than 25 percent.[224] Although there are no exact numbers of how many of the almost 150,000 residents who did not return would have liked to have returned or still desire to return someday, it is likely that renters are disproportionately represented among those who did not return to their communities.

SECTION 3: SOLVING THE "RENTERS' DILEMMA"

Human rights related to housing of renters are often violated in post-disaster reconstruction processes. Being landless, renters are often excluded from compensation schemes or receive less compensation and aid than land-owners. Moreover, the right to return of renters is often severely curtailed. There seems to be an assumption that renters are more flexible in being relocated or resettled than land-owners, but this is an unproven assumption. In many cases government authorities' rationale seems to be that renters will be able to find a housing solution in the free housing market, a notion which does not take into account the distortion in such markets caused by the natural disaster. Solutions that could open up a path to land or housing ownership to renters are in most cases not even considered.

Based on the international human rights standards and guidelines and the case studies, we suggest the following ways of responding to the renters' dilemma:

1. Post-disaster shelter arrangements should address the special vulnerabilities of renters, especially renters from vulnerable groups such as minorities, socioeconomically marginalized groups, women, and the elderly. Shelter assessments need to incorporate renters as a group and the search for shelter solutions for renters should be as important as the search for shelter solutions for home owners.

2. Reconstruction planning should incorporate durable solutions for renters.
   a. Renters should be eligible for assistance to be able to afford adequate and affordable rental housing. This can be done through subsidies, tax credits, temporary low-rent or rent-free arrangements or employment and income generation schemes.
   b. If sufficient funds are available and it is politically feasible, governments should facilitate the ability of renters to acquire land and housing in the process e.g., by providing free or subsidized land, credit systems, construction subsidies and allowances.

3. Renters who cannot afford their rent in the aftermath of a disaster should be protected from forcible evictions or when evictions cannot be avoided, provided with alternative housing solutions.

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[224] James R. Elliott and Jeremy Pais, "Race, Class, and Hurricane Katrina: Social Differences in Human Responses to Disaster", *Social Science Research* Vol. 35 Issue 2, 2006, p. 295–321

4. Governments and humanitarian agencies should honor the right to return of renters and facilitate that return if it is feasible and desired by the renters. Ideally, competent authorities should seek to rebuild or build collective, affordable, and/or public housing where necessary to support the voluntary return of its residents.[225] Should they not wish to return, displaced renters have the same rights as other internally displaced persons to integrate locally in the area to which they have been displaced, or to settle elsewhere in the country.

5. As stated in the IASC *Operational Guidelines*,[226] renters should be consulted and participate in the planning and implementation of transitional shelter and permanent housing programs.

6. Shelter solutions should try to preserve communities and social networks to the greatest extent possible.

BACK TO THE RENTERS OF HAITI

As we have seen from many other examples, no equitable shelter solution can be found without incorporating the needs of renters. This is especially true for Haiti, where 70–80 percent of the disaster victims were renting their homes before the earthquake. A recent survey by Lusk/André[227] shows that many Haitians have little stake in the reconstruction because they are renters and have received no assurance that their needs will be addressed through housing reconstruction. Given the massive destruction in the housing sector, rental prices have tripled from pre-earthquake levels, making return difficult even for those renters whose pre-earthquake houses were still habitable.[228]

Moving forward, the Haitian government and donors will need to strike a delicate balance between the interests of land and homeowners and those of renters to ensure the success of the reconstruction process. The last several months have witnessed increased evictions of IDPs—the majority of whom are former renters—as landowners seek to recover their land.[229] These evictions serve as a stark reminder of how pressing it is to find durable solutions for the displaced.

With a new Haitian president and government not expected to take office before May 2011, it is unlikely that a comprehensive shelter strategy will be in place before this summer, a time when many

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225 Brookings-Bern Project on Internal Displacement, *Protecting Internally Displaced Persons: A Manual for Law and Policymakers*, October 2008

226 Brookings-Bern Project on Internal Displacement, *IASC Operational Guidelines on the Protection of Persons in Situations of Natural Disasters*, January 2011, p. 39

227 Rock André, Jayson L. Lusk, *What Do Haitians Need After the Earthquake?*, 2011

228 Le Monde diplomatique, "Haiti in the Hands of the NGOs", January 2011, http://mondediplo.com/2011/01/06haiti

229 Representative of the Secretary-General on the Human Rights of Internally Displaced Persons, Mr. Walter Kälin, *Human Rights of Internally Displaced Persons in Haiti: Memorandum based on a Working Visit to Port-au-Prince (12–16 October 2010)*, November 2010, http://ijdh.org/wordpress/wp-content/uploads/2010/11/Kalin-Statement-2010-Haiti-English.pdf, p. 5

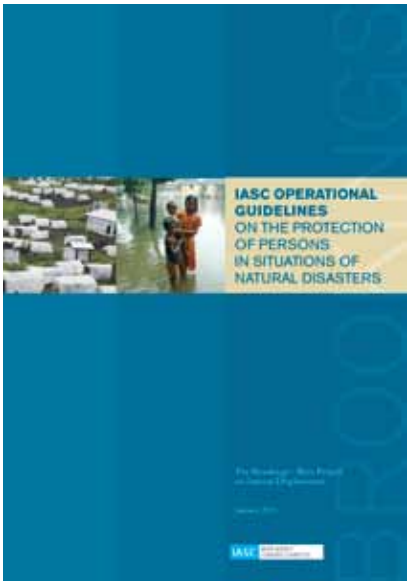
Haitians will spend their second rainy season under tarps and tents. In the absence of government leadership, international humanitarian agencies are working to resolve some of the trickier housing issues, including development of a strategy to respond to the needs of renters. We hope that this renters' strategy will incorporate the lessons learned from previous post-disaster shelter experiences and that it will propose ways to give renters a fair share and a meaningful stake in the reconstruction of Haiti.

Given the amount of aid pledges that Haiti has received, and assuming that the pledged money will arrive, guaranteeing the right to adequate housing for all affected by the earthquake should be an achievable target—a target against which the success or failure of the Haitian reconstruction process will be measured.

A campaign to help victims of the Chinese earthquake took to the streets of Chinatown in Buenos Aires, Argentina.

ANNEXES

ANNEX A: PUBLICATIONS ON NATURAL DISASTERS BY THE PROJECT ON INTERNAL DISPLACEMENT IN 2010*



IASC OPERATIONAL GUIDELINES ON THE PROTECTION OF PERSONS IN SITUATIONS OF NATURAL DISASTERS

Human rights don't disappear the moment an earthquake, a hurricane, or a tsunami strikes. As witnessed after the Indian Ocean tsunami, the earthquake in Haiti and many other disaster situations that during relief and recovery efforts the protection of human rights grows in importance because it safeguards the dignity of those affected. People are at their most vulnerable in times of crisis, so preventing discrimination and abuse of their rights is vital to effective disaster response operations.

To promote and facilitate a rights-based approach to disaster relief, the Inter-Agency Standing Committee (IASC) adopted Operational Guidelines on Human Rights and Natural Disasters in 2006. The Guidelines are a major contribution to the promotion of a rights-based approach in situations of natural disasters. Following the feedback from the field-testing of the guidelines, the IASC incorporated lessons-learned from the field into a revised version of the Guidelines. This revised version also expands the rights-based approach to include preparedness measures. Small steps in preparedness can have a major impact once a disaster strikes.

The Brookings-Bern Project on Internal Displacement published the IASC Operational Guidelines in January 2011.

* All publications are available on our website: www.brookings.edu/idp

PROMOTING AND PROTECTING RIGHTS IN NATURAL DISASTERS: WORKSHOP MODULES AND FACILITATOR'S GUIDE

For the past three years the Project on Internal Displacement has organized workshops on "Promoting and Protecting Rights in Natural Disasters" in all regions of the world with the participation of representatives from national and local governments, UN agencies, international and local NGOs, and Red Cross/Crescent representatives. These workshops have introduced the IASC Operational Guidelines on Human Rights and Natural Disasters and have provided a forum for discussion of good practices in promoting and upholding human rights in disaster risk reduction, emergency response and recovery.

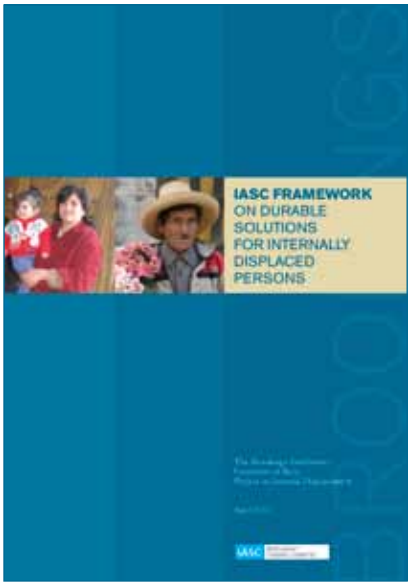
The workshops have shown that there is both a broad interest in strengthening protection in situations of natural disasters and also a need for training about what it means to apply a rights-based approach. These training modules are intended to encourage others to organize training courses or sessions on human rights and natural disasters. The materials include a comprehensive agenda, facilitator's guide, session modules, PowerPoint presentations, and resource materials for a two-day workshop on "Promoting and Protecting Rights in Natural Disasters." The modules are based on the workshops we have previously held and have been reviewed by international protection specialists with a specific focus on introducing the IASC Operational Guidelines on Human Rights and Natural Disasters.

The content ranges from basic information about a rights-based approach and protection issues to more specific areas such as protection of specific at-risk groups and protection monitoring tools. The program can be used in its entirety or be incorporated into larger workshop agendas. The modules can easily be adapted to local contexts and a wide variety of audiences.

IASC FRAMEWORK ON DURABLE SOLUTIONS FOR INTERNALLY DISPLACED PERSONS

Displacement is a life-changing event. While the often traumatic experience of displacement cannot be undone, internally displaced persons (IDPs) need to be able to resume a normal life by achieving a durable solution. As articulated in principle 28 of the Guiding Principles on Internal Displacement, IDPs have a right to, and often need assistance in their efforts to achieve, a durable solution. Guiding Principles 28–30 set out the rights of IDPs to durable solutions, the responsibilities of national authorities, and the role of humanitarian and development actors to assist durable solutions.

Principle 28 recognizes that the competent authorities have the primary duty and responsibility to establish conditions, as well as provide the means, which allow IDPs to return voluntarily, in safety and with dignity, to their homes or places of habitual residence, or to resettle voluntarily in another part of the country. Securing durable solutions for the internally displaced is also in the State's best interests. Leaving IDPs in continued marginalization without the prospect of a durable solution may



become an obstacle to long-term peace stability, recovery, and reconstruction in post-crisis countries.

Facilitating durable solutions requires that all stakeholders—including national and local authorities as well as humanitarian and development actors—work together, identify the right strategies and activities to assist IDPs in this process, and set criteria that will help to determine to what extent a durable solution has been achieved.

The Framework on Durable Solutions for Internally Displaced Persons aims to provide clarity on the concept of a durable solution and provides general guidance on how to achieve it. This version of the Framework builds on a pilot version released in 2007, which the Inter-Agency Standing Committee welcomed and suggested be field-tested. The Framework was revised and finalized in 2009, taking into account valuable feedback from the field on the pilot version and subsequent drafts.

ANNEX B: 2010 ARTICLES, REPORTS AND SPEECHES

January

Rights Amid the Rubble: Human Rights for Haiti's Quake Victims
Elizabeth Ferris

Drawing Humanitarian Lessons from Disasters
Diane Paul

February

Comments on FEMA's National Disaster Recovery Framework

March

Natural Disasters, Conflict, and Human Rights: Tracing the Connections
Elizabeth Ferris

Next Steps for Haiti: Rebuilding the Lives of Haiti's Internally Displaced Persons
Walter Kälin

May

In El Salvador, a Firsthand Look at Human Rights and Natural Disaster Response
Elizabeth Ferris

June

Promoting and Protecting Rights in Natural Disasters in South-East Asia
Workshop Report

July

Haiti Six Months On
Elizabeth Ferris, Daniel Petz

August

Earthquakes and Floods: Comparing Haiti and Pakistan
Elizabeth Ferris

September

Burning Issues for Haiti's Recovery
Elizabeth Ferris

November

Disasters and Displacement: Gaps in Protection
Roberta Cohen, Megan Bradley

When Disaster Strikes: Women's Particular Vulnerabilities and Amazing Strengths
Elizabeth Ferris

Natural Disasters and Human Rights: Comparing Responses to Haiti and Pakistan
Elizabeth Ferris

ANNEX C:
2010 EVENTS AND WORKSHOPS

January
Disaster Response in Haiti
Brookings Institution, Washington DC

February
Building Haiti's Future: Is Protectorate Status the Best Option?
Brookings Institution, Washington DC

April
Regional Workshop on Natural Disasters and Human Rights
San Salvador, El Salvador

May
Regional Workshop on Protecting and Promoting Rights in Natural Disasters in South-East Asia: Prevention and Response
Yogyakarta, Indonesia

September
Responding to the Historic Floods in Pakistan: Political and Security Considerations
Brookings Institution, Washington DC

December
Haiti: Assessing Political and Humanitarian Developments
Brookings Institution, Washington DC

Transcripts and audio versions of the events hosted at the Brookings Institution are available on our website:

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